

1895



1936

February 15, 1936

Mutiny Divides U.A.W. Officials

Dillon's Subordinates Take Over Management of Union Until Elections

Special to AUTOMOTIVE INDUSTRIES

Smouldering dissension among officials of the general executive board of the United Automobile Workers of America, international A. F. of L. affiliate, flared out this week in open rebellion against the authority of F. J. Dillon, president, who was appointed by William Green to head the new union during its probationary period.

A faction headed by Homer Martin, vice president, and Ed Hall, secretary-treasurer, has taken over the U. A. W. office in Detroit and, according to these officials, will conduct the office independently of Mr. Dillon until his successor has been elected at the convention to be held some time in April. Mr. Dillon is not a candidate for the office of president, but he has no intention of quitting under fire, and means to retain his post until his successor is duly elected. How the affairs of the union are to be handled during the controversial period is not clear. The opposing factions occupying adjoining offices have closed the doors between them.

"I am apprehensive of the future for
(Turn to page 202 please)

William C. Durant Files Petition in Bankruptcy

A once great name in the automotive industry was again in the news last week, when William C. Durant filed a petition in bankruptcy in the New York Federal Court on Feb. 8.

His petition estimated liabilities at \$914,231, all of which was said to be unsecured claims, and his assets were listed as \$250 worth of clothes. Mr. Durant's formal statement expressed the hope that he would again some day be in a position to repay in full all creditors "if fortune favors me."

Mr. Durant is no longer young—he is now in his seventy-fourth year—and chances seem poor that fortune will again favor him. His last attempt to stage a comeback in the automotive industry, in which he had won and lost
(Turn to page 207 please)

In This Issue

	Page
<i>Junking Plans of Manufacturers Easing Off.....</i>	210
<i>Attention to Quality Paramount at Fisher-Olds Body Plant</i>	212
<i>Fifty Years of Aluminum and the Automobile Industry</i>	216
<i>Firestone Air-Spring Aims at Smoother Ride</i>	220

I.C.C. Gets Flood of Last Minute Truck Applications

Midnight last Wednesday was the deadline for truck operators to file application under the Federal Motor Carrier Act, the so-called "grandfather" clause of which provided for registration of truck operators in business on or before last July 1.

The Interstate Commerce Commission received a flood of last-minute mail, estimated at about 70,000 pieces, each one of which was believed to contain at least one application. Some envelopes received by the Commission have contained as many as 100 applications. No estimate has been made of the actual number of operators who have filed applications, but it is believed most of the "grandfathers" got theirs in before the deadline. Two or three weeks will

(Turn to page 203 please)



International Photo

W. C. Durant

Month's Schedule 12% Under Jan.

Weather Hindering Car Shipments as Well as Retarding Retail Sales

By HAROLD E. GRONSETH

February production of the motor industry will be about 12 per cent under that of January and 5 per cent under February, 1935, if plants adhere to present schedules. Officials point out, however, that the picture can change quickly if the weather moderates and sales respond with a good pick-up. Undoubtedly some upward revisions would then be made by factories that cut their schedules rather sharply the first of the month.

On the basis of present plans, the industry should turn out in the neighborhood of 336,000 units this month, compared with roughly 383,000 in January and 353,781 in February last year. Official figures are not yet available on output of the entire industry in January but the report of the Automobile Manufacturers Association showing production of its members last month at 276,350 units indicates that the industry's total will be close to 383,000 units.

There is little question but that the current quarter's output will go well beyond the million mark. Indicated pro-

(Turn to page 203 please)

Lincoln Runs Second Shift To Meet Demand for Zephyrs

Second shifts are now in operation in several departments of the Lincoln Motor Co. Detroit plant to increase production of V-12 Lincoln Zephyr motor cars. Output as a result is rising to 125 per day, scheduled for the current month and additional production machinery has been ordered. The company has been behind on orders since the introduction of this new model Nov. 2.

Total retail sales since the car was introduced to the end of January were 2224. During January retail sales of Lincoln Zephyr cars in Wayne Co., Mich., which includes Detroit, exceeded any other make in its price class. The Lincoln Zephyr total was 76 cars as against 65 for the next make, 26 for the third and 21 for the fourth.

Swiss Firm Shows Passenger Diesel

Saurer Makes Road Tests With 6-Cyl. Oil Engine Fitted in Plymouth Sedan

Special to AUTOMOTIVE INDUSTRIES

At the Amsterdam automobile show, the Saurer Co., of Arbon, Switzerland, displayed a new six-cylinder Diesel in a standard Chrysler Plymouth chassis, replacing the normal Plymouth gasoline engine. The vehicle was a production job assembled of American parts, for the Swiss market. A four-door, five-passenger sedan body was fitted.

The engine has a bore of 3.15 in. and a stroke of 4.73 in., giving a displacement of 220 cu. in., and it develops 72 hp. at 3000 r.p.m. It occupies the same space as the gasoline engine and as the engine block is of light alloy, the weight of the powerplant is not excessive.

Prepared for road tests, carried out under the control of the Swiss Automobile Club, the Diesel-engined Plymouth weighed 3968 lb. empty and with four passengers, ready for the runs, 4718 lb. A normal Plymouth sedan, with a slightly smaller engine of 170 cu. in., used to check against the Diesel job, weighed 3197 lb. empty and 3968 lb. with four passengers.

Fuel consumption tests over three different routes gave the following results:

Distance	Diesel	Gasoline
42.3 m.	1.475 gal.	2.435 gal.
62.2 m.	2.17 gal.	3.57 gal.
	28.7 m.p.g.	17.4 m.p.g.
45.3 m.	1.396 gal.	2.55 gal.
62.2 m.	1.92 gal.	3.545 gal.
	32.4 m.p.g.	17.5 m.p.g.
53.1 m.	1.67 gal.	Gasoline
62.2 m.	1.95 gal.	car not used
	33.2 m.p.g.	

The fuel consumption over the three routes, a distance of 140.7 miles, was 4.54 gal. of Diesel oil, giving 31 miles per U. S. gal.

The hill climbing tests gave the following results:

High gear, average gradient 7.6 per

cent—23.6 m.p.h.

Second gear, average gradient 10.8 per cent—26.1 m.p.h.

First gear, average gradient 19 per cent—13.66 m.p.h.

Tests were made for starting up with the engine at various temperatures. With the external air at the uniform temperature of 51 deg. Fahr. and the cooling water at the same temperature, black smoke was emitted for three seconds. The engine was started in 11.4 seconds. With the cooling water at 62.6 deg., the time was 1.6 seconds without the emission of smoke. The same results were obtained with the cooling water at 75 deg., while at 104 deg. the start was instantaneous, with a perfectly clear exhaust.

During all the fuel consumption tests there were no signs of exhaust smoke. At the maximum speed of 59 m.p.h. there were faint traces of gray smoke. In the hill-climbing tests, with gradients varying from 7.5 to 19 per cent, there was a slight amount of black smoke, which was attributed to overfeeding of the automatically controlled fuel governor. There was no noticeable smell, even with the engine overloaded on the hill climbs.

International Petroleum Show Will Be Held at Tulsa in May

Improvements in refining gasoline and oil to meet the needs of high speed and high compression motors will be demonstrated at the Ninth International Petroleum Exposition to be held in Tulsa, Okla., May 16 to 23, according to W. G. Skelly, president. Exhibits will be valued at \$10,000,000, representing more than 1000 different firms, and will cover 15 acres of exhibit space.

W.-O. to Begin Building 15,000 More Next Month

Willys-Overland Co. has completed the manufacture of the last half of the 10,000 order granted last fall by

Judge George P. Hahn in federal court and will begin bringing off finished cars again about March 10 under the new 15,000 order.

More than 6500 cars have already been ordered and payments on them made by dealers. Materials are being received and preliminary manufacturing operations are under way. About 1000 men are employed in the plant now. David R. Wilson, receiver, reports continued demand from dealers for cars as well as a good export demand.

Illinois Gives Trucks Reciprocal Treatment

State Official Says States Must End Archaic Barriers To Truck and Bus Traffic

By EDWARD J. HUGHES
Secretary of State of Illinois

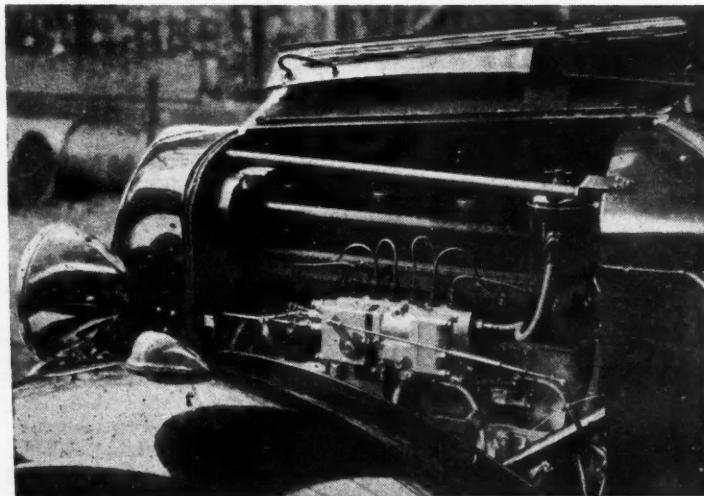
Special to AUTOMOTIVE INDUSTRIES

The motor vehicle law that was passed at the session of the Illinois legislature just ended, gives to foreign truck operators the same privileges and courtesies as are granted to Illinois operators. Illinois operators, however, are not granted the same privileges in other States.

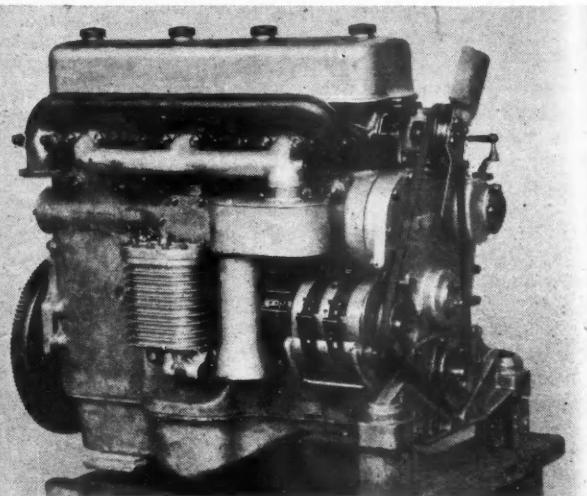
It is only a question of time, to my mind, until every state must recognize that freedom of movement of trucks engaged in transportation of freight and other commodities has outgrown state lines. They must be accorded reciprocal rights of entry.

Laws which are on the statute books of several states today are as archaic and as antiquated as are the stone hatchets of the prehistoric ages. They are a detriment to the people in those states. They are a hindrance to transportation.

In the effort to bring about reciprocal agreements with other states, Illinois has taken the initiative and instructions have been issued to all automobile



Injector side of Saurer Diesel engine and at right the exhaust port side.





Berlin competitors have their cars inspected before leaving for the Monte Carlo Rally

investigators to give to truckers from foreign states the same privileges as are granted to Illinois bus and truck operators.

Also, reciprocal agreements have been effected between Illinois and the bordering states of Indiana, Iowa, Missouri, Michigan and Wisconsin.

I believe that with interstate trucking operations under federal commerce commission control it will be but a comparatively short time until some form of action is taken to break down state line barriers.

It is my personal belief that action to this end is necessary. The trucking and the automotive industries cannot ever hope to be elevated to the pinnacle to which they belong until this is done — either by the Federal government, or by reciprocal agreements between the states.

Sedan-Limousine Offered by Chrysler on De Luxe Eight

Demand for a very large, commodious and luxurious car, to be either owner-driven or chauffeur-driven, has resulted in the development of a sedan-limousine with LeBaron body on the 133-in. wheelbase Chrysler DeLuxe Eight chassis. The car seats seven passengers.

Two body styles are provided, one having a sloping division and forward-facing auxiliary seats and the other a vertical division and opera type seats. They are priced respectively at \$1,895 and \$1,865 at the factory, Detroit. In both styles the glass partition between front and rear compartments can be completely raised or lowered, giving privacy when desired. The front compartment is trimmed in black hand-buffed colonial leather. A choice of light or dark taupe Laidlow broadcloth is available for rear compartment trim. Interior hardware, body mouldings, dome and corner lights are of standard Chrysler design, finished and color plated to harmonize with the trim material. A large folding arm-rest in the center of the rear seat conforms to the shape of the side arm rests.

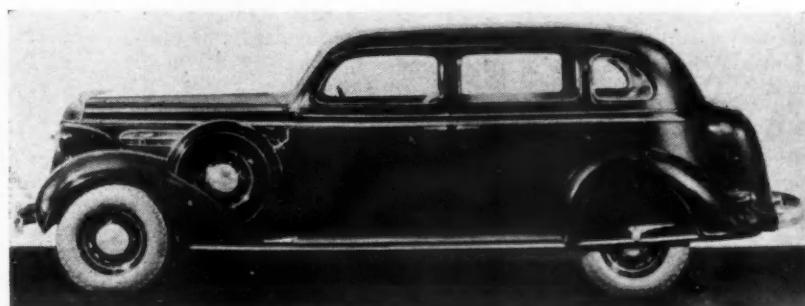
Ford Driver's Trick Turn Wins Monte Carlo Rally

A V-8 Ford, driven by two Romanians, Zamfirescu and Cristea, won the first prize of \$3,400 in the Monte Carlo rally. They were followed by a Delahaye and a Renault, with another Ford in fourth place out of 100 starters.

The competitors in this event had to come from various parts of Europe up to 2500 miles on a rigid time schedule, and on arrival had to submit to a final test including braking, reverse, a figure eight and acceleration. Cristea on the winning Ford proved himself by far the most skilled in the final tests. He reversed by skidding the car around, and in order to facilitate this, ran without a differential and locked the rear wheels by hand control. Several Ford competitors connected the rear wheel brakes with the steering, so that a brake was applied on one side only when the steering wheels were approaching full lock.

William C. Chapman

William Carl Chapman, Ford Motor Co. advertising executive, died last week in Henry Ford Hospital at Dearborn, after an illness of several months. He was 47 years old and leaves a widow and one daughter.



Chrysler offers a LeBaron sedan-limousine on the DeLuxe 8 chassis, 133-in. wheelbase.

Akron Now Hopes For Labor Peace

Latest "Sit-Down" Ends As Union Heads Condemn Workers' Hasty Actions

Special to AUTOMOTIVE INDUSTRIES

Following the agreement reached between an employee committee and the management of the B. F. Goodrich Co., which ended the tire industry's third and most serious "sit-down" strike, Akron tire industry leaders join in expressing the belief that the last word has been written to the "sit-down" epidemic which has plagued major tire plants for the last several weeks and caused serious interruptions in plant operations. Under the terms of the agreement, Goodrich officials claim they were assured that in the future accepted procedure would be followed in settling employees' grievances, and that the men involved would remain at work while negotiations were being conducted, instead of enacting "sit-down" strikes.

The agreement followed conferences between S. H. Dalrymple, national president of the United Rubber Workers of America and L. L. Callahan, president of the Goodrich local union. Action of the Goodrich management in refusing to pay employees who remained idle at their posts during several shifts was approved by Dalrymple who stated:

"It is my opinion that compensation being paid by industry to employees in the way of strike benefits is detrimental both to industry and to our own United Rubber Workers. It would have the tendency to induce workers to sit down or to strike to such an extent that it would keep the local union and the management in confusion."

Union officials took over and consummated the negotiations although they knew nothing of the "sit-down" until after the men had quit their work. At a mass meeting of more than 1000 rubber workers held on Sunday, Feb. 9, Dalrymple stated:

"Such cessation of work does not demonstrate efficiency. On the other hand, it does demonstrate a dual movement. The proper way to handle grievances (Turn to page 206, please)

Our Production Plant Obsolete, Says Sloan

G. M. President at Pontiac Dinner Sees Big Opportunity For Capital Goods Industry

Nearly 1000 citizens of Pontiac, Mich., gathered in the gymnasium of the Pontiac High School, Tuesday evening, for the civic dinner given in honor of Alfred P. Sloan, Jr., president of General Motors Corp.

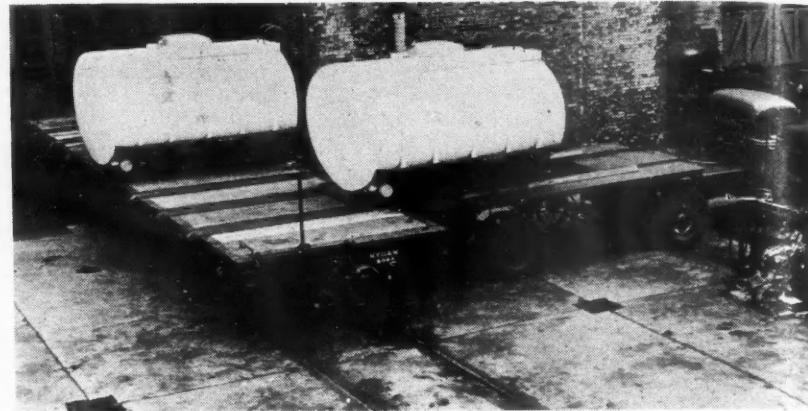
One of the features of the event was the unveiling of Jerry Farnsworth's life-sized canvas of the Ottawa chief, Pontiac, a gift of the people of the city to the motor company which bears its name, made possible by a penny subscription campaign that resulted in the collection of nearly 90,000 pennies.

The principal address of the evening was by Mr. Sloan. Short talks were also made by W. S. Kundsen, executive vice-president, and R. H. Grant, vice-president of General Motors Corp.

In discussing opportunities for the future, Mr. Sloan said, "I was astonished the other day to see passing over my desk a requisition from one of our divisions. It indicated that it is now possible to produce with 20 machines what required 100 machines eight or ten years ago. The point I want to make is that industry and science together during the depression have been doing wonderful development work in producing new instruments of production.

"I think it is fair to say that the production plant of America today is obsolete in view of what has taken place," continued Mr. Sloan. "It is generally recognized that the big opportunity to reduce unemployment is in the capital goods industry. I believe that there exists the greatest opportunity that has ever faced America. I think that we have got to give more consideration to a better balance between the various factors that are involved in industry. One thing we have got to do is most certainly to make every producer a bigger consumer. That means, among other things, that industry should work toward reducing the cost of goods and service. I am out of sympathy with these people who say technological advance has thrown so many men out of employment. It is true that that is happening all the time, but we do not consider that the elimination of men reduces the cost of goods and service.

"I am a bull on the future," Mr. Sloan declared. "If we will manage our affairs intelligently, there are tremendous possibilities in the future, but in order to capitalize on them we have to do a more intelligent job. We have to do more research work. We have to give more consideration to the fundamentals. We have to look at the productive side and the consuming side and obtain, as I said before, a better balance."



A bridge between railway car and trailer facilitates the movement of tank from one to the other.

Device Shifts Tanks From Car to Trailer

A new container system for the quick transfer of a load from a flat car to a tractor-trailer combination, or vice versa, has been developed by the Motor Terminals Company, Graybar Bldg., New York, N. Y. The system is here illustrated as applied to the transportation of liquids in tanks, but it is equally applicable to the transportation of bulk commodities.

A flat car of the steel underframe type is equipped with transverse anchorage rails with 50-in. centers, to take either a tank or a truck body on each pair of rails. The same freight car can also carry a merchandise freight body 8 ft. wide, 8 ft. high and either 20 or 24 ft. long. To transport these larger bodies over the road, a longer trailer is required which is maneuvered into a position paralleled with the freight car for loading.

Mutiny Divides U.A.W. Officials

(Continued from page 199)

the labor movement in Detroit," was Dillon's comment. He laid the difficulties to lack of experience of officials on the board, personal ambitions and the insidious influence of Communistic elements.

"In the end, management will pay," he said, "for not recognizing and supporting the legitimate trade-union movement which is their only guarantee against irresponsible leadership and incessant and uncalled for strikes."

Mr. Dillon's opponents claim they have the wholehearted support of the rank and file of membership and, unless other members of the executive board fall in line, predict their replacement at the polls in the April election. "There is probably some division of opinion among the board members," they admitted.

The revolt came to a head as the result of a dispute in connection with is-

surance of charters to Toledo unions. A charter was granted early this week by Dillon to the Chevrolet union in Toledo. At the same time another charter signed by Hall and Martin was issued to a different group in Toledo who sought to maintain the old set-up which had been in effect prior to chartering of the U. A. W., and which provided for one union covering several plants.

Flying Boats to Use Diesels

A regular semi-weekly air service across the Southern Atlantic is being conducted at present by the German Lufthansa in conjunction with the French Air France. The Germans for their part of the service use Dornier Whale flying boats, but these are shortly to be replaced by a new type of flying boat.

Chrysler Designers' Case Argued in Federal Court

Federal Judge Edward J. Moinet took under advisement arguments of attorneys for the National Labor Relations Board and the Chrysler Corp. in the controversy over whether or not an election should be held among designing engineers at Chrysler plants. Hearings were held last Monday on the question of issuing a permanent injunction to replace the restraining order granted two weeks ago prohibiting the Board from holding the election petitioned for by the Society of Designing Engineers, which seeks to be designated the exclusive bargaining agency for the engineers.

Attorney Patterson, for the Board, maintained that the election would facilitate settlement of disputes, that majority principle is one of the best guarantees the employer has against the closed shop and that an agreement could not be made with the majority that would be unfair to the minority. Hal Smith, speaking for the corporation, decried the creation of an exclusive agency that would deprive minorities and individuals of their rights, defending proportional representation

provided for under Wolman board rules which "has protected minorities and also protected the whole industry while it moved forward with increased success and less labor difficulty than any comparable industry in America."

The judge's decision is not expected to be given until after the hearing next Monday on a similar question involving an election at the General Motors Truck plant in Pontiac, asked by the Associated Automobile Workers of America. A restraining order also had been issued in this case and subsequently the plant union intervened protesting the election. Another hearing is to be held the same day on the A.A.W.A. charges of discrimination by the truck company in the discharge of three employees.

Month's Schedules

12% Under Jan.

(Continued from page 199)

duction for the first two months is 718,000 units and general expectations are for considerably heavier operations in March. In fact, it is not improbable that the first three months of 1936 will rank second only to the record first quarter output of 1929. It would require a March output of 445,000 units for the current quarter to nose out the corresponding period of 1926 which stands as the second largest initial quarter of any year. Other years in which the million mark was passed during such period are 1928 and 1930.

Present restricted operations of motor plants were caused not only by the retarding effect of severe weather on retail sales but also by difficulties in moving new cars from the factories. Because of icy or snow-bound roads, truck haulways all but stopped for days. Those that moved made slow progress and finished cars began piling up in factories and on the lots of truck-

ing companies. Some shipments were diverted to railroads, but only a relatively small percentage of the total was rerouted. The situation has been relieved by curtailment at the plants and by gradual improvement in road conditions. One manufacturer reports that a recent check-up showed that cars were moving from trucking lots at a considerably better rate and the number stored was fast dwindling.

Chevrolet Motor Co. reported production for January of 104,193 units, an increase of 45,795 over January, 1935, and 12,609 units more than the company's best previous January in 1928. Figures included 100,039 domestic and export units and 4154 built in Canada. January marked the third month in succession having production exceeding 100,000 units and was the seventh 100,000 car month in 11 months. Production beginning with November, 1935, when the current new models were introduced, through January totaled 328,553 units. Each of the three months set a new all-time record as compared with corresponding months. Chevrolet's first 100,000 car month was March, 1927. This year was the first time January reached six figures.

Studebaker

Studebaker sales in January were one-third greater than in the same month last year. . . . January sales of passenger cars and trucks amounted to 6020 units compared with 4507 in 1935; 2538 in 1934; 4330 in 1933; 4681 in 1932; and 4348 in 1931.

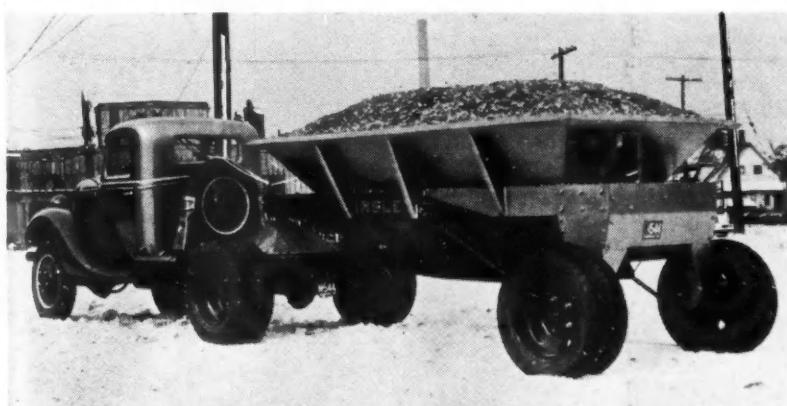
ICC Gets Applications

(Continued from page 199)

be required by the Commission to determine the number of applications received.

A.T.A. Supports Eastman & Job

That the office of Federal Coordinator of Transportation should be continued as a permanent part of the Federal regulatory system for transportation was a recommendation of the policy committee of the American Trucking Associations, meeting in Chicago last week. The committee also went on record as directing the A.T.A. to support Joseph B. Eastman for the position of coordinator.



Marmon-Herrington all-wheel-drive Ford V-8 tractor hooked up with a new Insley semi-trailer dump wagon of five cu. yd. capacity. Weight of entire unit is slightly over 8500 lb.; gross load about 25,000 lb. Numerous tests prior to showing at Cleveland and Purdue indicate ability to negotiate a grade of about 28 per cent with a pay load of 17,500 lb. Total overall length is 26 ft. 9 in., turning radius, 28 ft. 3 in. Entire unit lists at less than \$2600 complete.

Stout Designs Home For Modern Nomads

Movable House on Trailer Provides all the Comforts of Home—Without the Taxes

A movable house for modern gypsies has been designed by William B. Stout, founder and head of the Stout Motor Car Corp., who is convinced that the time is near when an increasing number of families will want to get away from a house and lot and the accompanying taxes.

The "Stout mobile home" is built on a trailer, 16 ft. long and 6 ft. 6 in. wide, light enough to be drawn behind a passenger car at normal speed. The house opens out to form a living-room 20 ft. across and 14 ft. long, supplemented by a galley, or kitchen, fully equipped. It has a refrigerator, gas stove, hot and cold water tanks with automatic water heater, gas tank equipment, closets, pantry, buffet, bar and dining table. All of these are a part of the unit design. Six chairs are part of the equipment, two of them being arm chairs, and the other four becoming wide single beds.

When the house is extended it can be divided into two twin bedrooms and a living room. A small coal stove furnishes heat in cold weather. The walls are insulated so that there is no condensation when a fire is built on a cold day. Windows are all of sliding glass, with brass wire screens.

If desired, the house is furnished complete for living, with furniture, bedding, dishes, linen, knives and forks and kitchen equipment.

There are doors at the front and rear, with closets on both sides of the front entrance. The rear half of the central part is occupied by the kitchen. Either side of the center section folds out for 7 ft. on either side. One side only of the house may be folded down for a one-night stop, giving room for sleeping and access to the kitchen.

The structure weighs less than 3000 lb. equipped. On the road it is supported on two motor car wheels with drop axles and vacuum servo brakes operated from the tow car.

Detroit Gasket Sold to Diehls and Associates

The Detroit Gasket and Manufacturing Co. has been sold by the Crown Cork and Seal Co., Inc., of Baltimore to Lloyd H. Diehl, president, and Edward W. Diehl, secretary and treasurer of the Detroit company, and their associates. Thus with the acquisition of all security holdings, control of the company passes back into the hands of its directing heads.

Recapitulation plans call for an increase in capital stock to 300,000 common shares and 63,500 shares of 6 per cent cumulative preferred \$20 par value stock.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for AUTOMOTIVE INDUSTRIES

There was a slight improvement in general business last week. Despite the cold and stormy weather, retail trade increased; and wholesale business also turned upward. Aside from the grains, several commodities registered price advances.

Carloadings Higher

Railway freight loadings during the week ended Feb. 1 amounted to 621,839 cars, which marks an increase of 37,148 cars above those in the preceding week, a gain of 24,878 cars above those a year ago, and a rise of 56,438 cars above those two years ago.

Food Prices Decline

Retail food costs during the two weeks ended Jan. 14 declined by 0.9 per cent. The current index, based on the 1923-25 average as 100, stands at 81.7, as compared with 82.5 two weeks earlier and 75.8 on Jan. 2, 1935.

Electrical Output Steady

Production of electricity by the electric light and power industry in the United States during the week ended Feb. 1 was moderately above that in the preceding week and 11.4 per cent above that in the corresponding period last year.

Employment Rose in December

According to the Bureau of Labor Statistics, about 323,000 workers were returned to jobs in December,

in manufacturing and non-manufacturing industries. Weekly payrolls in these industries during the same month were \$13,300,000 above those in the preceding month.

Lumber Shipments Higher

Lumber shipments during the week ended Jan. 25 were 12 per cent above those in the preceding week and reached the highest level since October. New business declined 7 per cent, and production fell by 2 per cent.

Crude Production Slightly Lower

Average daily crude oil production for the week ended Feb. 1 amounted to 2,815,550 bbl., as against 2,820,500 bbl. for the preceding week and 2,448,000 bbl. for a year ago.

Fisher's Index

Professor Fisher's index of wholesale commodity prices for the week ended Feb. 8 stood at 83.5, as compared with 84.0 the week before and 83.9 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Feb. 5 showed an increase of \$3,000,000 in holdings of discounted bills. Bills bought in the open market and Government securities remained unchanged. Money in circulation increased \$49,000,000, and the monetary gold stock declined \$11,000,000.

To offset these reductions, the gasoline tax has been raised from two to three cents, thereby conforming more closely to rates in neighboring states.

"We think we have a more equitable distribution of the total tax on automobiles," said Mr. Connor, "since the use of the highway is reflected in the additional gas tax feature, while the registration part of the tax is made to conform more nearly to that of our neighbors. I doubt if there will be any appreciable change in the total receipts, so far as the highway department is concerned, as a result of these changes, and actually the figures indicate that there will be about a 5 per cent increase in the funds from these two sources."

GM Sales in January Set New High for That Month

General Motors' sales to dealers in the United States and Canada plus overseas shipments totaled 158,572 units last January, setting a new high for any corresponding month in the corporation's history. This represented an increase of 61 per cent over the corresponding month of last year and tops by 30,992 units the previous January high in 1929.

Sales to United States consumers totaled 102,034 units, an increase of 89 per cent over the 54,105 units sold to consumers during January, 1935. Sales to U. S. dealers showed somewhat less increase indicating a proportional decrease in dealer inventory.

All January sales were somewhat lower than the figures for December, 1935, for in that month General Motors not only sold more than twice as many cars as in any previous December, but also sold more cars than in any other month in 1935.

The accompanying table shows the General Motors' sales figures in detail:

	Jan., 1936	Dec., 1935	Jan., 1935
Sales to U. S. dealers	131,134	150,010	75,727
Sales to U. S. consumers	102,034	122,198	54,105
Change in dealer inventories +	29,100	+ 27,812	+ 21,622
Canada & Overseas sales	27,438	35,688	22,541
World sales	158,572	185,698	98,268

Earnings Statements of Automotive Companies

Vehicle Manufacturers

	1935	1934
Chrysler Corporation	34,975,819	9,534,836
Sterling Motor Truck Co., Inc. (Year ended Oct. 31)	73	*2,283
Stutz Motor Car Co. of America (Year ended Oct. 31)	*239,902	*246,545
Twin Coach Co.	571,917	201,354

Other Automotive Companies

Acklin Stamping Co.	34,232	
Caterpillar Tractor Co.	5,949,307	3,651,190
City Auto Stamping Co. (preliminary)	476,138	66,892
Formica Insulation Co.	155,012	25,825
Kelsey-Hayes Wheel Co.	†1,716,897	326,392
Libbey-Owens-Ford Glass Co.	8,167,420	3,161,831
Motor Wheel Corporation	1,087,979	409,673
National Bearing Metals Corp.	433,343	329,532
Noblitt Sparks Industries, Inc.	557,865	302,711
Thompson Products, Inc.	\$617,375	381,288

Miscellaneous

Goodyear Tire & Rubber Co.	1,445,198	1,428,835
Sunray Oil Corp. (Del.) & Sunray Oil Co. (Okla.) \$	179,291	158,748

*Net loss. †Includes non-recurring profit of \$474,124. ‡—11 Months. §—Nine months ending Sept. 30.

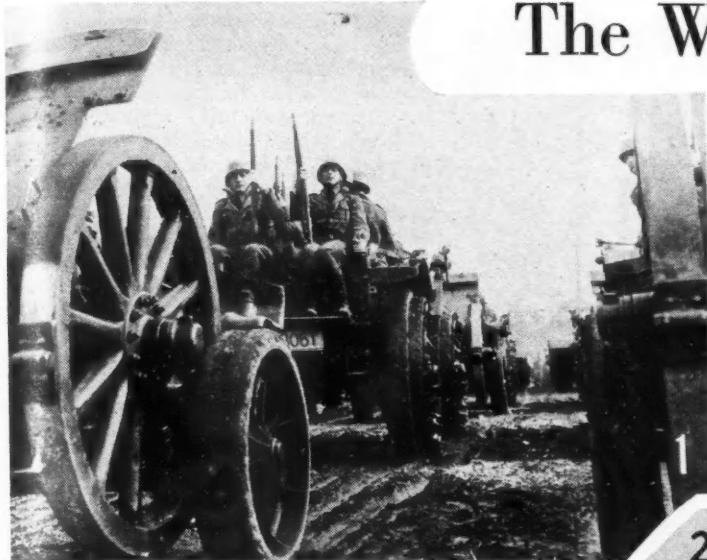
Poco Mfg. Co. Becomes Bendix Corp. Subsidiary

The Poco Manufacturing Corp. of Philadelphia has become a Bendix subsidiary according to an announcement made by Vincent Bendix, president of Bendix Aviation Corp. The chief products of the Poco Corp. are devices for regrooving and slotting tires. With Bendix-Poco equipment any one of the various X diamond or zig-zag patterns commonly used for tire treads can be reproduced. A slotted type spiral tread design, known as "Nu-Grip," has also been developed by this company.

Connecticut Lowers Plate Fees and Raises Gas Tax

The State of Connecticut has reduced motor vehicle registration fees more than 50 per cent for 1936. The reduction, according to Michael A. Connor, commissioner of motor vehicles, was prompted by the loss of revenues in-

The WORLD on WHEELS



1

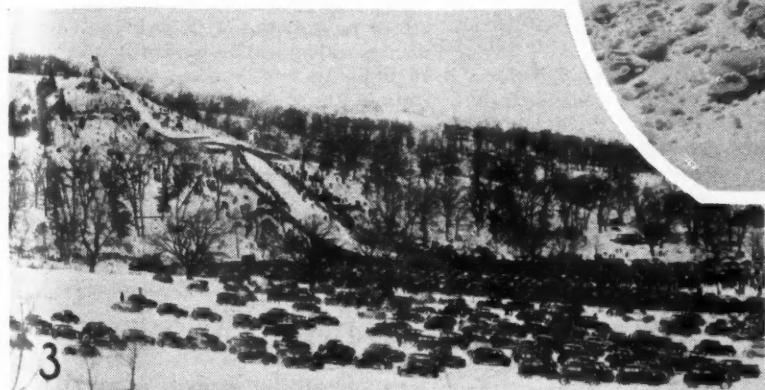
(1) The new 13th Regiment of Mussolini's "Wheels of Death"—the motorized artillery—proudly parades near Rome

(2) Snowplows had to go to the rescue of motorists stranded on roads near Chicago during recent blizzards



2

(3) Skiing has become America's most popular winter sport, and automobiles take the snow-gliders to their favorite slopes.



3



4

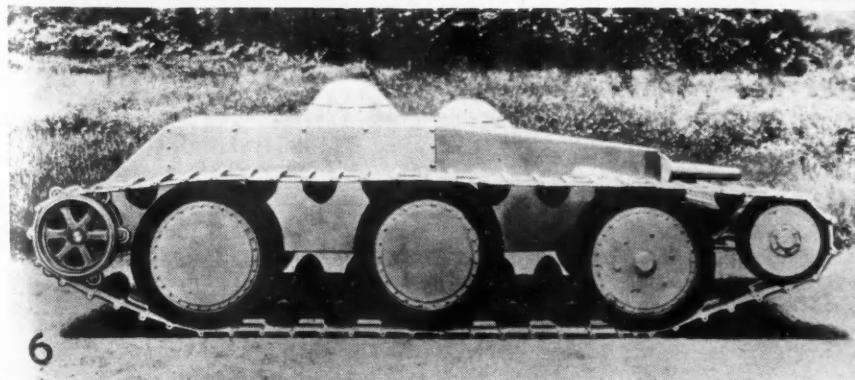


5

(4) From Paris to New York and back to Paris in 45 hours is the ambitious flight planned by Captain Rossi in this "Typhon" two-motor Caudron-Renault plane

(5) Some of the power shovels shown at the recent Roadbuilders Association's show in Cleveland

(6) Walter J. Christie claims for his new tank a speed of 65 m.p.h. with caterpillars attached, and 95 m.p.h. on the wheels alone



6

Acme, International and Wide World photos.

Automotive Industries

February 15, 1936

Automotive Demand For Steel Is Rising

Lower Prices Have Become General on Sheets, But Heavier Steels Are Firm

An indication that automotive demand for flat steels is quickening is seen in the emphasis that is being laid on price concessions in the market for sheets and strip steel. If fresh buying was as light as it is painted in some quarters, and if there were not considerable business overhanging the market, quotations would be of but academic interest to competing steel producers.

The unmistakable fact, however, is that more and more specifications are coming through in anticipation of more extensive assemblies in the near future, especially so for full-finished automobile sheets and kindred descriptions of steels that require longer than others to turn out. Although here and there it is claimed that price concessions are confined to certain areas and certain classes of consumers, it is obvious that in all representative tonnage transactions the lower prices have come to be the market.

The relatively high rate at which Detroit finishing mills have been operating of late must be interpreted in the light of these concessions, although other factors, such as convenient access to sources of supply in traffic-interrupting weather, also come in for consideration. While manufacturing wire prices have also been subject more or less to concessions, those for the general run of heavier steel products, such as hot rolled and cold finished steel bars, are holding firm.

In sharp contrast with the marked expansion of capacity in the flat steel field there has been little, if any, addition so far to the country's steel bar capacity. The American Iron and Steel Institute reports a 4 per cent increase in this week's steel ingot operations, the employed capacity being given as 52 per cent, the highest rate in a month. Whether or not this can be taken to denote a trend, economic conditions in general support the impression that activity in the steel industry is in the ascendancy and that, therefore, prices, while perhaps not headed for higher ground, are also unlikely to yield any.

Pig Iron—Aside from unfavorable weather conditions, the movement of pig iron to automotive foundries is slowed down by fairly adequate reserve stocks in melters' yards, some of it contracted for before last year's \$1 a ton price advance. Prevailing quotations remain unchanged.

Aluminum—The market is very much of a routine affair. The scrap intake of secondary producers has been slowed down by the weather. Prices are unchanged all around.

Copper—While consuming demand for copper is moderate, Wall Street is circulating reports of heavy buying by electrical manufacturers overhanging the market, especially so in the event of a T.V.A. decision favorable to private industry. A fractional advance would, therefore, hardly come as a surprise.

Tin—Rumors, emanating from London,

that the International Tin Committee may recommend smaller production quotas for the second quarter caused prices to stiffen, with spot Straits quoted at 47½ cents at the beginning of the week, ¼ cent above the preceding week's close.

Lead—Firm.
Zinc—Quiet.

Akron Now Hopes for Labor Peace

(Continued from page 201)

ances is through your union officers when a controversy with management arises. All possible means of a peaceful settlement should be used. If all other efforts fail, there is still time to strike."

The Goodrich "sit-down" in the tire building division, followed similar demonstrations at the Firestone and Goodyear plants, and necessitated a complete shutdown of the Goodrich plant from 7 o'clock Saturday morning, Feb. 8, until 6 o'clock Monday morning, Feb. 10. The strike itself affected over 1500 non-involved employees, while the complete plant closing cost all Goodrich employees (about 8500) many thousands of dollars in wages. The company agreed to pay all such employees for three hours of every shift lost, but refused to pay the participants in the "sit-down" for the time they remained idle.

The tire industry's first "sit-down" strike developed in the Firestone truck-tire department when several hundred employees quit work in protest over the company's suspension of Clay Dicks, unionist employee, following an alleged altercation between Dicks and a non-union employee whom unionists claim the company had installed in the

department as a pacemaker to speed up production. This initial "sit-down" spread and involved several hundred employees who remained in the factory throughout one entire night, singing, playing cards and playing checkers on improvised checker boards with milk bottle caps as checker men. The "sit-down" ended when the management agreed to pay the men for three hours.

At Goodyear the "sit-down" in the tire pits was in the nature of a protest over a slight wage reduction. Goodyear officials at once mustered in its "flying squadron" of experts trained in all factory operations, and issued an ultimatum to the striking employees giving them 15 minutes to resume work or lose their jobs. They resumed work at once. Goodyear officials claim that even after the wage reduction the men were being paid \$1.22 per hour.

While the tire industry from its inception has been an open-shop industry, considerable headway has been made, under the original impetus of the N.R.A. in building up unions affiliated with the American Federation of Labor. A year ago the industry narrowly averted a strike when managements of major tire companies refused to recognize unions. Employee votes at the time showed employees opposing the strike movement. Although in the minority, union workers pushed plans for an industry-wide strike. Company officials installed flood-lights on their factories, built high barbed-wire fences around all buildings, provided sleeping quarters for employees who wished to continue to work, and prepared for a siege. At the last minute, through negotiations of the Department of Labor, the strike was averted.

Industry-Labor "Legislature" Will Be Proposed by Berry Committees

Establishing of an industry-labor "legislature" as a permanent body, independent of government control, to formulate and recommend national policies for industry and labor, will be urged before the Council for Industrial Progress at its meeting in Washington late this month, it is reported.

Unanimous decision to this end is said to have been reached by the seven standing committees of the council which are now in session in Washington to prepare reports and make recommendations to the council. The council was organized by George L. Berry, industry coordinator. The committees, like the council itself, is made up equally of representatives of industry and labor, and to each has been assigned a subject for possible legislation for joint consideration prior to reporting to the full council.

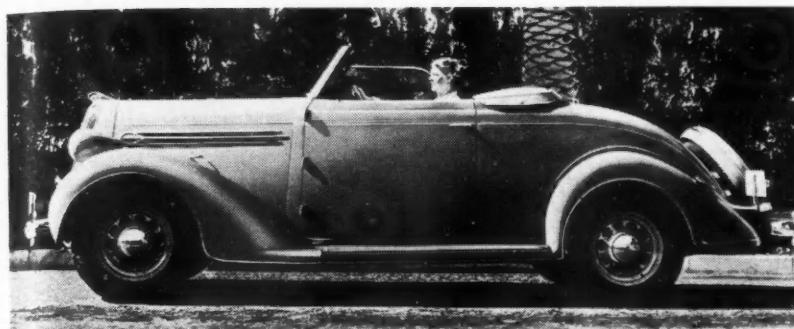
Under the proposed plan the government would be asked to provide funds for setting up headquarters with a staff having statistical facilities to carry on the work of the industry-labor "legis-

lature." Members of the "legislature," however, would receive no compensation. It has not as yet been determined where the headquarters would be set up, though probably it would be in either Washington or New York. By making the "legislature" independent of the government in its operation, it was pointed out, it could function equally well under one administration as another and be freed of commitment to the policies of the government itself.

John G. Paine is joint chairman of the National Council for Industrial Progress.

AMA Member Production Was 276,350 in January

Further evidence of the successful operation of the automobile industry's program for stabilizing year 'round employment schedules was presented today in the regular monthly production report released by the Automobile Manufacturers Association which revealed that the total output of Asso-



Plymouth's new convertible coupe is equipped with rigid all-weather top which fits snugly into a recess behind the driver's seat.

ciation members last month set a new record for January.

The January output of the group was 276,350 cars and trucks—an increase of 36 per cent over the same month last year. The best previous January output for the group was in 1929 when 269,812 units were produced. Last month's output was 14 per cent under December's production.

The estimate, which covers the operation of all but one of the major automobile producers in the United States, is based upon reports of factory shipments. It is summarized below:

January, 1936	276,350
December, 1935	321,266
January, 1935	204,015

William C. Durant Files Petition in Bankruptcy

(Continued from page 199)

many fortunes, was unsuccessful when he planned to enter the small car market with an American-built French Mathis which never got into production. His previous venture with the Star, which he thought would repeat the success of Chevrolet, also failed to repeat his previous successes with General Motors.

Mr. Durant's associates say that he is "working every minute," and that he has never lost interest in the stock market and the automotive industry. Mr. Durant, explaining his petition, said:

"My petition in bankruptcy, filed today, is due to frequent and repeated court proceedings, instituted by a few creditors, representing less than 5 per cent of my total obligations, who have attempted to obtain a preferential position."

"Action by the creditors referred to has prevented me from giving my best efforts to rebuilding my fortune, and I no longer propose to be harassed and annoyed. I wish to state that all creditors will be treated alike, and if fortune favors me, will be paid in full."

The Detroit Rex Products Co., 13008 Hillview Ave., Detroit, Mich., manufacturers of Detrex solvent degreasers, Triad and Perm-A-Clor non-inflammable solvents, and Triad Alkali cleaning compounds and enamel strippers, has moved its eastern sales region offices to Room 630, Bush Terminal Sales Bldg., 130 West 42nd Street, New York City.

Three-Way Parts Show Likely Again This Year

Prospects are bright for a three-way Automotive Service Industries Show this year, to be sponsored jointly by National Standard Parts Association, Motor and Equipment Wholesalers Association and Motor and Equipment Manufacturers Association. The executive committee of the M.E.W.A. is scheduled to meet in Chicago, Feb. 18, at which time it is expected that final decision on the part of this group will be made.

Chrysler's 1935 Profits Are Best in Company's History

The Chrysler Corp., in its annual report for 1935, stated that the year had been the best in the corporation's history, with earnings equivalent to \$8.07 a share. Sales volume for the year of \$516,830,333 represented an increase of 38 per cent over the previous peak in 1929 and 43 per cent over 1934. The 1935 net profits totaled \$34,975,819 as compared with \$9,534,836 in the previous year.

Concurrently, the corporation's board of directors has announced a dividend of \$1 a share on common stock, payable on March 31 to stockholders on record of March 2.

40 Years Ago

with the ancestors of AUTOMOTIVE INDUSTRIES

The last decade of the 19th Century is pre-eminently the age of noise. In the general pandemonium, the clatter of iron hoofs, the clash of steel tires, and the creak of ball-bearingless axles are prominent factors. When the motor comes in, with its rubber tires and improved bearings . . . then we shall realize that one of the blessings of the motor vehicle, and one perhaps we had not fully anticipated, is that it is a conquerer of noise.

—From *The Horseless Age*,
February 1896.

Dealers Must Sell 5 Used Cars to 3 New

Trade-ins Should Be Chief Sales Activity, Says N.A.D.A. Editor

Used cars should constitute the major source of sales activity of automobile dealers, Walter E. Blanchard, editor of the *National Automobile Dealers Association Bulletin*, told the annual luncheon meeting of the Missouri Automobile Finance Association in St. Louis last week.

Every dealer, he said, although he may have a new car franchise, primarily is a used car operator, because he has to handle and sell more used cars than new ones, and there is nothing he can do about it if he wants to obtain any kind of volume. The fact, he continued, that the average dealer does not put the same energy into selling used cars that he does in promoting new car sales is one of the reasons for the used car problem.

He asserted that statistics gathered by N.A.D.A. from its members show that in 1934 the selling of 2,292,443 new cars and trucks involved the handling and selling of 3,851,304 used cars. In 1935, he said, the estimated sale of 3,251,468 new cars involved the handling and sale of approximately 5,364,922 used cars. For the current year, he said, it is predicted that new car and truck sales will approach 5,000,000, and using the same ratio as existed in 1935, if the estimate is correct, automobile dealers will be called upon to market some 8,000,000 used cars, making the total 13,000,000 units.

Dealers generally, he asserted, expect the soldiers' bonus to help the sale of both new and used cars.

Some startling facts have been revealed in N.A.D.A. surveys, he asserted. Tabulation of reports from 1058 dealers, handling all makes and from all states and various population groups, showed that only 588 had a gross profit in their used car department, and only 19 made a net profit in it.

"One thing stands out clearly in these figures," he said, "and that is the used car operations are the chief source of loss; also that a gross profit is a prerequisite to any net profit. While there are other factors contributing to the high rate of mortality in the trade, the used car loss is at the root of the trouble and major relief will come only through a correction of that situation."

Blanchard explained that the major activity of the national dealers association for 1936 looks forward to such correction, and that the entire trade is now taking a vote by mail on whether it shall proceed with the program of establishing a predetermined gross profit in the used car department.

The annual meeting of the stockholders of the Auburn Automobile Company was held last week. Roy H. Faulkner, president, reports that all officers and directors were re-elected.

British Car Imports Rose 30%, Exports Increased 7% in 1935

Exports of motor vehicles, parts and accessories from Great Britain increased in value last year to £12,108,102, from £11,332,950 in 1934, a difference of 7 per cent. Imports into Great Britain had a proportionately

greater rise, from £2,954,843 in 1934 to £3,845,382 last year, an increase of 30 per cent. Detailed figures showing British exports and imports, as reported by *The Motor Trader*, are shown as follows:

Imports	Units	1935 Value in £	1934 Value in £
Passenger cars	12,333	1,961,075	1,578,292
Commercial vehicles	340	64,473	47,648
Chassis	3,022	356,408	271,029
Parts		1,463,426	1,057,874
Total		3,845,382	2,954,843
Exports			
Passenger cars (new)	44,191	5,488,431	34,851
Passenger cars (used)	4,235	501,834	3,746
Commercial vehicles	2,251	789,264	2,365
Chassis (commercial)	11,434	1,765,819	11,372
Chassis (other)	10,326	879,554	9,026
Engines	9,384	225,211	14,077
Spark plugs	1,044,805	75,466	1,321,932
Parts		2,382,523	89,708
Total		12,108,102	11,332,950

Thompson Products Buys Eagle Machine Co. Business

Thompson Products, Inc., Cleveland, has recently purchased the sleeve inventory and cylinder sleeve business of the Eagle Machine Co., Indianapolis, a pioneer manufacturer of "wet" and "dry" sleeves for the replacement market. The Thompson line now consists of the Centrif-I-Cast dry sleeve, the Chrome-Nickel iron alloy wet sleeve, and the Nitricastiron cylinder sleeve which was developed abroad.

France Awards Legion of Honor to Automotive Men

Louis Renault has been awarded the Grand Cross of the Legion of Honor, the highest distinction conferred by that body. M. Renault today is an outstanding figure in the French automobile industry. With his two brothers, he began building automobiles in a small shop in Billancourt near Paris in the

pioneer days of the industry. One of the brothers lost his life in the fateful Paris-Madrid race and the other died some years later. Louis, the only survivor, has been continuously at the head of the Renault firm which he built up

until today it employs in the neighborhood of 30,000 people.

Henri Petit, editor-in-chief of *La Technique Automobile et Aérienne*, of Paris, has been named a knight of the Legion of Honor. M. Petit is a talented and prolific writer on automobile-engineering topics whose contributions appear in the daily *L'Auto* and in the weekly *La Vie Automobile* in addition to the paper which he edits.

Goodall Sanford Acquires Reading Rubber Mfg. Plant

Goodall Sanford Industries announces that it has acquired the Reading Rubber Manufacturing Co., of Reading, Mass., including all its patents, trademarks and good-will. The Reading Rubber Manufacturing Co. plant adjoins Sanford Mills "L," the Leatherwove Division, and this will enable Sanford to operate both mills as a unit in the future. They will continue to specialize in rubberized and lacquer finished fabrics for the automotive, railroad and interior furnishing fields.

Sanford Mills plans to modernize and revamp the machinery and equipment in the Reading plant. L. C. Chase and Co., Inc., the selling division of Sanford Industries, will continue the sale of Reading products as heretofore.

NRA Study Seeks to Eliminate Friction in Automotive Industry

A study which considers the automotive industry as a unit in its manufacturing and distributing processes can eliminate factional group bias, and through a more complete understanding of the motivating causes, many of the so-called "issues" or "friction points" can be overcome, to the betterment of the industry.

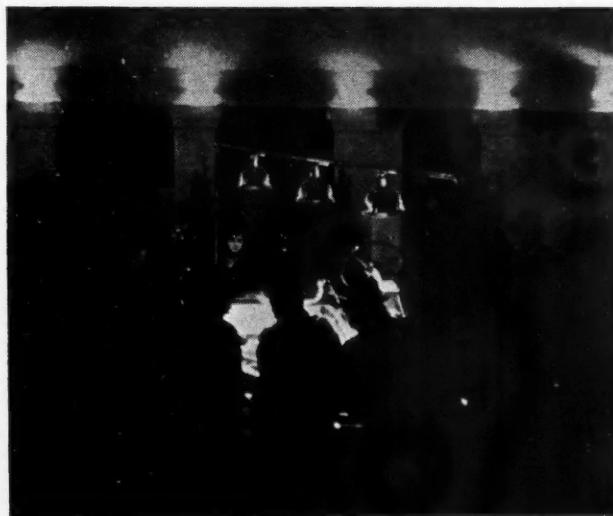
The foregoing conclusion is definitely drawn in the preliminary summary of findings growing out of the

economic N.R.A. study of the automotive industry. It covers the manufacture and distribution of automobile and parts. Together with other preliminary reports, it has been submitted as part of the elaborate studies made of industries covering the pre-code, code and subsequent periods. The studies are to be incorporated in a report to be made to the President and the Congress by the Department of Commerce, to which the remainder of the N.R.A., except as to its Consumers' Division, has been transferred, preliminary to abolition of the N.R.A. on April 1. The report is being prepared for the purpose of preserving what Secretary of Commerce Daniel C. Roper has called the "assets" of N.R.A. The summaries carry only the highlights of the voluminous reports which have been completed or are nearing completion.

The summary of the automotive industry study suggests a list of areas for further fields of study, which, it is contended, should answer certain controversial problems still present in the automotive industry and trade.

The proposed areas for study are listed as follows:

"(1) Has the development of the automobile industry progressed beyond its sales policy and method of distribution? In other words, has the automobile been accepted by the consuming public to such an extent that it can no



Barcelona's subway is the site of an exhibition of Ford cars staged by Ford Motor Iberica. Beneath the Plaza Cataluña—the "Times Square" of the Spanish seaport—the exhibit fills a space of 2275 sq. ft. A six-piece orchestra and popular singers furnish entertainment for the 3000 daily visitors.



W. S. Roberts
who has been appointed general manager of General Motors' Southern California Division at Los Angeles.

longer be considered a 'specialty' product and therefore no longer lends itself to specialty selling methods? (The essential characteristics of its distribution methods have remained static for the past 20 years.)

(2) If the present method of distribution no longer serves the purpose of delivering the product most effectively and at least cost to the consumer, would a centralized selling depict be more effective and efficient?

(3) If the present distribution system is found to be correct, then what adjustments should be made in order to overcome 'the used car problem,' 'factory-dealer relations,' 'multiplicity of dealer relationships,' 'seasonal adjustment of selling prices,' etc.?

(4) Is the automobile manufacturing industry a high-profit industry, as is popularly assumed? How are these profits distributed among executives, stockholders and personnel? What has been the effect of great strides in 'technological advancement,' their relative impetus during periods of slack demand, and their necessary function in bringing about increased productivity?

(5) What is the effect of the present foreign trade policy on the pro-rated 71,000 employed (1929), and the \$579,000,000 of exportable production (1929), within this industry?

(6) Why cannot a decrease in 'real' prices, contrary to established popular opinion, result in an accelerated increase in net sales and—what is most important—in an accelerated increase in net profits available for dividends; thus permitting the formulation of an economic philosophy based on the simultaneous procurement of—

- Lower 'real' prices and greater 'real' value to the consumer?
- Increased demand, increased employment and increased compensation for labor?
- Greater profits for the investor.
- An increase in public wealth and a corresponding stabilized prosperity?

"Cannot a scientific method of price determination be established that will

permit the planned economy of free competition?"

The summary points out that the automotive industry is comparatively young, being only three decades old in 1929, and can be considered to have been in the development stage until 1926 at least. It has furnished direct and indirect employment for more than 5,000,000 workers, it is explained; and is one of the largest, if not the largest manufacturing industry, employing directly in 1934 approximately 450,000 men annually in the manufacturing process and 350,000 in distribution processes.

"One of the unique features of the financial history of the automobile manufacturers is that they financed themselves almost entirely out of profits," the report says. "Certain periods in their growth are accompanied by the ratio of net income to average capital of some manufacturers running in excess of 50 per cent. During the past 10 years net income for these manufacturers has averaged approximately 30 per cent of their average capital stock. Their financial history contrasts with that of the public utility industry which has developed and expanded largely through the form of fixed indebtedness incurred through bond issues and the like."

The technological advance—improvement in mechanical processes of mass production—is declared to have enabled the industry so to reduce the cost of its finished product that in the short space of time between 1908 and 1912, one manufacturer was able to lower the price of his product from \$950 to \$550, and yet maintain his profit position by the material increase in demand resulting from the reduction in price.

"The competitive factors have been constantly present in this industry since its inception," it is stated. "At the present time three manufacturers dominate the industry, namely: Ford Motor Co., General Motors Corp., and the Chrysler Corp. These manufacturers at present account for more than

90 per cent of the total production in the industry, the balance being divided among 11 other manufacturers, known as the 'independents,' chief among which are Packard Motor Car Co., Studebaker Corp., and Hudson Motor Car Co."

The importance of style change and the addition of the utility aspect to the luxury pleasure aspects, it is pointed out, have increased demand, and together with price reductions have so broadened the market that in 1929 4,794,898 units were produced by 427,459 employees. The effect of the depression was to reduce these figures to 1,627,361 units and 190,027 employees in 1933. The competitive struggle during the depression years did not, however, cause a material downward adjustment by the factories in the price of their automobiles, it is stated. It was contended, however, the report explained, that greater value was being built into the merchandise by various mechanical and decorative improvements. Labor is said to have become restless as the workers out of employment increased. This restlessness is declared to have tended to bring to the surface certain grievances, either substantiated or unsubstantiated, held against the manufacturers. Chief among these were the contentions that "speed-up and espionage" were making conditions intolerable for those fortunate enough to be employed, it is stated.

"In the formulation of the codes for fair competition, the automobile manufacturers desired no interference or regulation in their productive processes," the report said. "However, they submitted and accepted a code with very flexible labor provisions and no trade practice provisions. The automobile parts and equipment manufacturers, due to their close manufacturing association with the automobile manufacturers, adopted similar labor provisions in their code. However, due to the greater integration of this group and the multiplicity of units they de-

(Turn to Page 228, please)

CALENDAR OF COMING EVENTS

SHOWS

Amsterdam, Netherlands, Automobile Show Jan. 31-Feb. 9

Germany, Automobile Salon, Berlin, Feb. 15-March 1

Finland, Automobile Show, Helsinki, Feb. 25-March 1

Austria, Automobile Show, Vienna, March 8-15

Switzerland, Automobile Show, Geneva, March 20-29

Hungary, Automobile Show, Budapest, Mar.-April

Illinois Automotive Parts Assoc. Maintenance Exhibit, Navy Pier, Chicago, April 4-8

Portugal, Automobile Show, Lisbon, begins April 16

Yugoslavia, Automobile Show, Zagreb, May 2-11

Spain, Automobile Show, Madrid, May 10-20

International Petroleum Exposition, Tulsa, Okla. May 16-23

Morocco, Fair of Tangiers May 16-24

Yugoslavia, 16th International Spring Fair, Lubiana May 30-June 11

CONVENTIONS AND MEETINGS

France, Automobile Exhibit at Foire de Paris May

Norway, Automobile Show, Oslo May

Assn. Highway Officials of No. Atlantic States, Atlantic City Feb. 12-14

American Society for Testing Materials, Regional Meeting, Pittsburgh, March 4

S.A.E. Tractor and Industrial Power Meeting, Milwaukee, Wis. April 15-16

American Gear Manufacturers Association, Twentieth Annual Convention, Philadelphia April 20-21

S.A.E. Production Meeting, Detroit, Mich. April 21-24

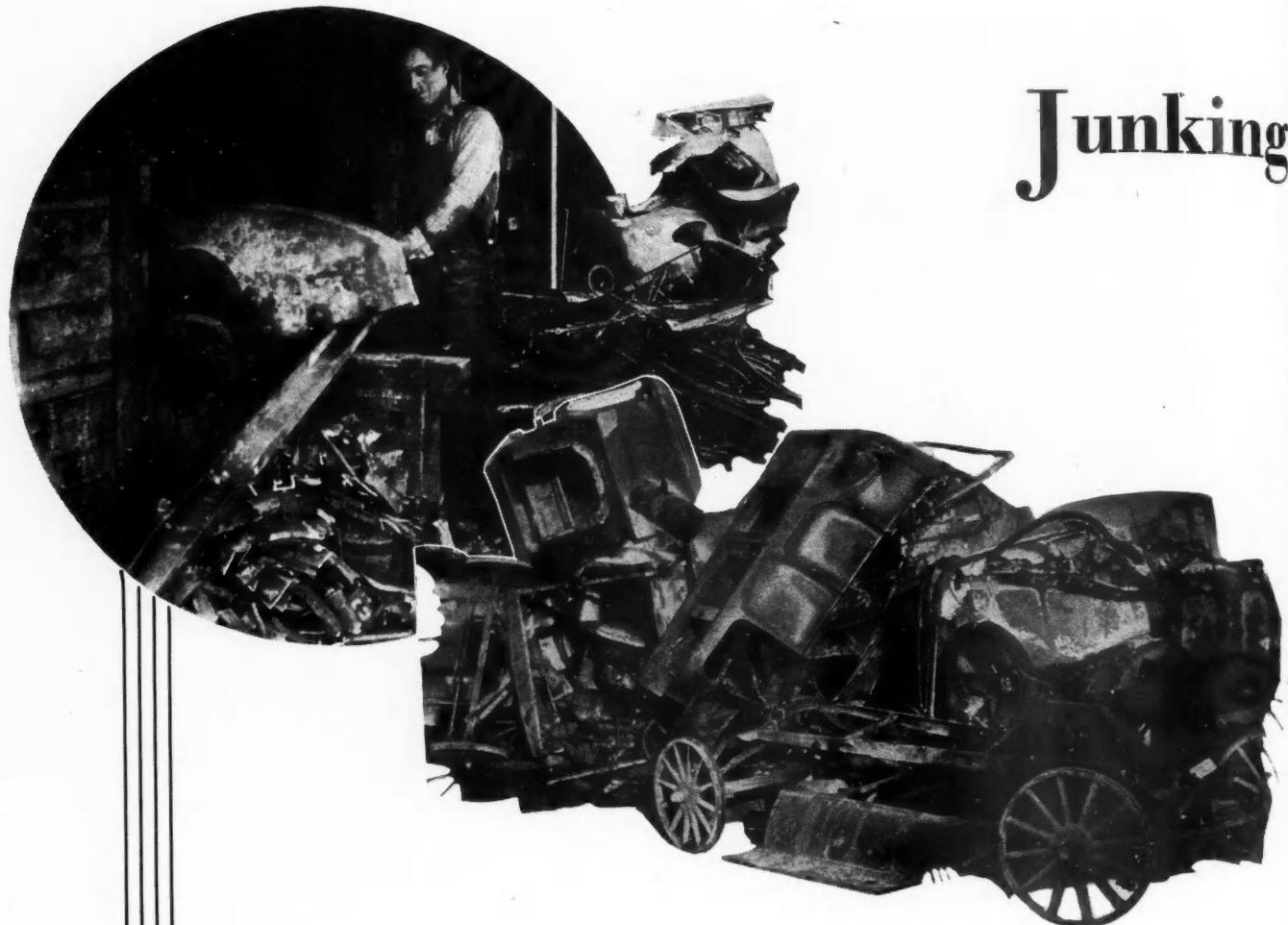
U. S. Chamber of Commerce, Annual Meeting, Washington April 27-30

American Petroleum Institute Mid-Year Meeting, Tulsa, Okla. May 13-15

S.A.E. Summer Meeting, White Sulphur Springs, W. Va. May 31-June 6

American Society for Testing Materials, Annual Meeting, Atlantic City, June 29-July 3

American Society for Metals, 18th Nat'l Congress, Cleveland, O. Oct. 19-23



Junking

By Harold E. Gronseth

plans in effect since the first of the year.

While no definite decisions have been made, it is unlikely that any of the junking projects now in operation will be continued beyond the end of February except for the time required in March to wind them up. Other General Motors divisions started out with programs to run through January and February.

By the end of that period it is expected that dealers will have succeeded in freshening up their used car stocks sufficiently to move them at more nearly the desired rate. Moreover, it is felt that the season then will be far enough advanced so that normal expansion in demand should bring satisfactory turnover without necessity for the additional prop provided by junking operations.

Used car disposal projects are not so practical in the good selling season. For obvious reasons, the seasonal demand for used cars in the lowest price bracket, from which junkers are drawn, is even more pronounced than for the better grade of used or new cars. Warmer weather does not require top mechanical condition to give acceptable

performance and buyers are more disposed to spend time tinkering with their cars when weather is favorable. The tendency, therefore, is for demand to expand down the price range as the season advances, and cars that might have been junked in the winter are likely to find a ready buyer in spring or summer.

Combined with the GM junking plans are various forms of bonus payments to salesmen, so that in addition to putting dealers' stocks in a more wholesome condition the programs have resulted in materially stimulating used car sales. Chevrolet reports marked success with its plan which climaxed a campaign started last spring when general sales manager W. E. Holler inaugurated national advertising for used cars, employing magazines and radio broadcasts to supplement other media.

Chevrolet is now on the air with the fourth series of 13-weeks programs since that form of used car advertising was adopted last spring. As result of the company's special efforts, Chevrolet dealers last year turned over their

APPARENTLY junking plans, this season, are to be limited to divisions of General Motors Corp. all of which are engaged in programs for retiring worthless vehicles from the road and stimulating the movement of used cars held by their dealers. Only Chevrolet and Pontiac have made public announcements of such programs, but Buick, Oldsmobile and Cadillac-LaSalle have had similar

Plans of Manufacturers Easing Off as Used Car Situation Approaches Normal

used car stocks, which average roughly 100,000 units, more than 13 times and January sales are expected to approach closely the best month's sales of 1934. It is estimated that more than 25,000 worthless vehicles were disposed of under the junking plan.

Amounts paid by the various divisions for cars juked are the same, \$20 per unit, but some limit the number that can be juked for compensation, and the bonus plans differ in operation. Cadillac-LaSalle has no limitation on number, but stipulates that payment will be made only when the car juked can be traced to a Cadillac or LaSalle dealer, since some dealers handle other lines. The factory contributes \$6 to the salesmen's bonus fund for every used car sold from stock on hand Jan. 1. The amount received from the factory is matched by the dealer and the fund is distributed by any method the dealer elects.

Pontiac sets up a credit to dealers for juking operations on basis of the number of new cars delivered during Jan. and Feb. at the rate of \$5 per car

and pays the dealer from this fund at the rate of \$20 for every car juked. Salesmen are awarded prizes according to points earned in a contest involving both new and used cars. The fund is made up of equal contributions by factory and dealer of \$1.25 per used car and \$1.50 per new car sold at retail during Jan. and Feb.

Buick's juking fund is based on the number of cars dealers took from the factory during the last four months of 1935, the dealer being credited with \$1.50 for every new car he purchased. Payment for juking is the same as by other divisions, \$20 a car. The factory's contribution to the salesmen's bonus fund is at the rate of \$1 per car taken by dealers during that period. The amount is duplicated by the dealer and the fund prorated monthly to salesmen on basis of each salesman's per-

centage of gross dealer volume of used car business during Jan. and Feb. A salesman must have a minimum of four used car sales to his credit each month to qualify for participation in the bonus distribution. Buick is working on another salesmen's bonus plan to start March 1, involving both new and used cars.

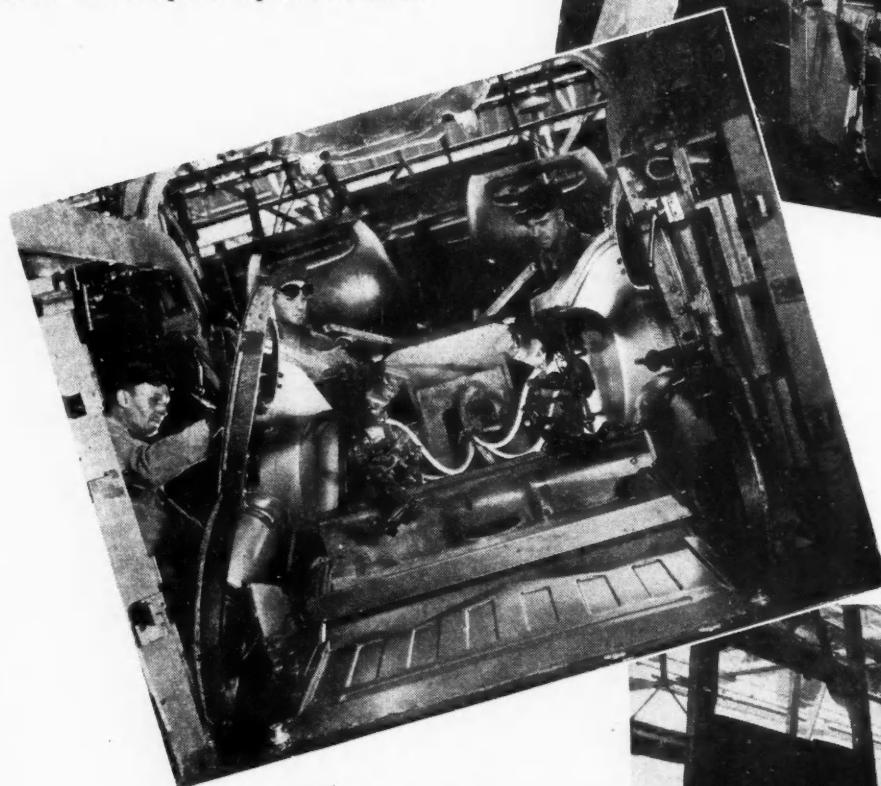
Oldsmobile determines the number of juked cars a dealer can be compensated for at \$20 each by the number of new cars billed to him during Nov. and Dec. He must have taken at least five cars to participate. Dealers taking more were rated on a staggered basis for participation in the juking fund. Factory and dealer contribute alike to the salesmen's bonus fund at the rate of \$2 each per car purchased by the dealers in Nov. and Dec. The January distribution on that basis applied only to used car salesmen, and plan of payment was left to the dealer. Similar amount is set aside this month for distribution to both new and used car salesmen on basis of each one's proportion of dealer's net sales.



Attention to Quality Paramount at

NOT so long ago it was considered good management if the plant was able to hold down the usage of expense materials—the less you used, the better was your record. Today at the new body plant of the Olds Motor Works (Fisher Body Division) in Lansing, if the paint shop uses less than a predetermined amount of pure lacquer—one to one and a quarter gallons per car—it's just too bad for all those concerned.

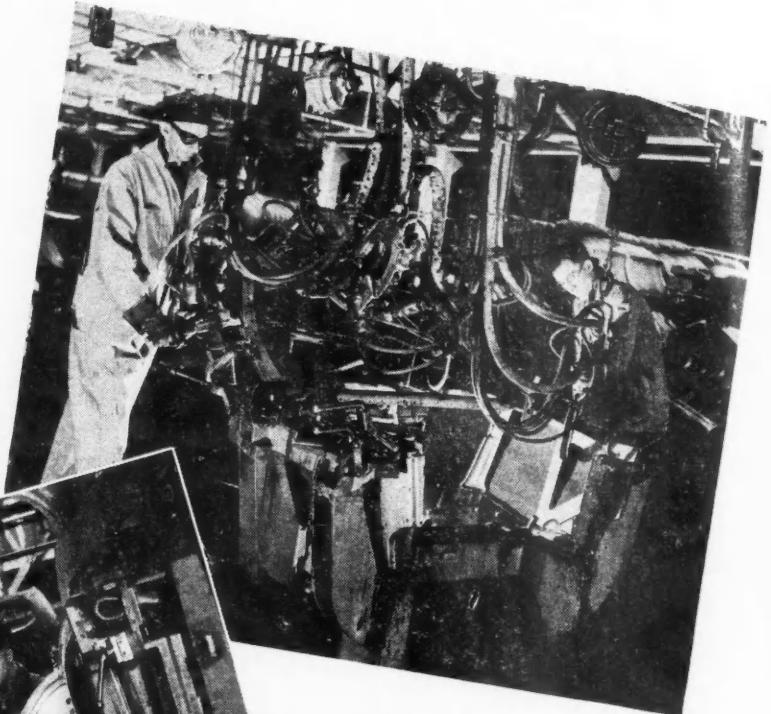
This fact alone is sufficient commentary on the operation of the Olds body plant. Quality control from the consumer's viewpoint is the criterion here. And the paint department boasts



Master framing fixture takes care of the main assembly as well as positive alignment of door and windshield openings. This fixture is fitted with a powerful exhaust duct which draws out dust and fumes and adds materially to the comfort of the workers

16 inspectors along the line to assure it.

Another point that strikes the observer is the painstaking attention given to details. The big part of the operation—welding, finishing, and trim



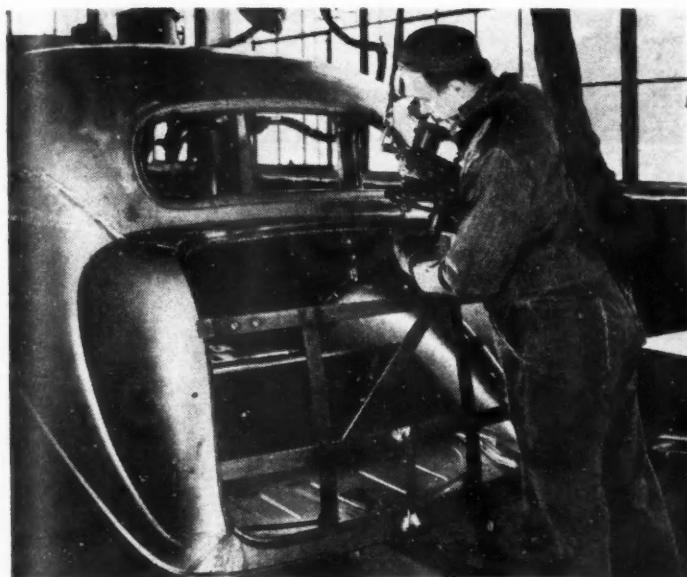
One of a battery of three machines for welding inner and outer cowl panels. Note the system of portable welding tools required at this station



Closed conveyor monorail line feeding large body stampings to the master welding fixtures

at Fisher-Olds Body Plant

By JOSEPH GESCHELIN



Set-up in a big welding fixture after framing. At the rear end, the operator is spot-welding the deck opening gutter with a portable gun. Bar welding fixtures at the front end complete several roof joints which are inaccessible with the tools used in preliminary operations

—is handled methodically, of course. But the finishing touches are the things that get minute care at all points in every department.

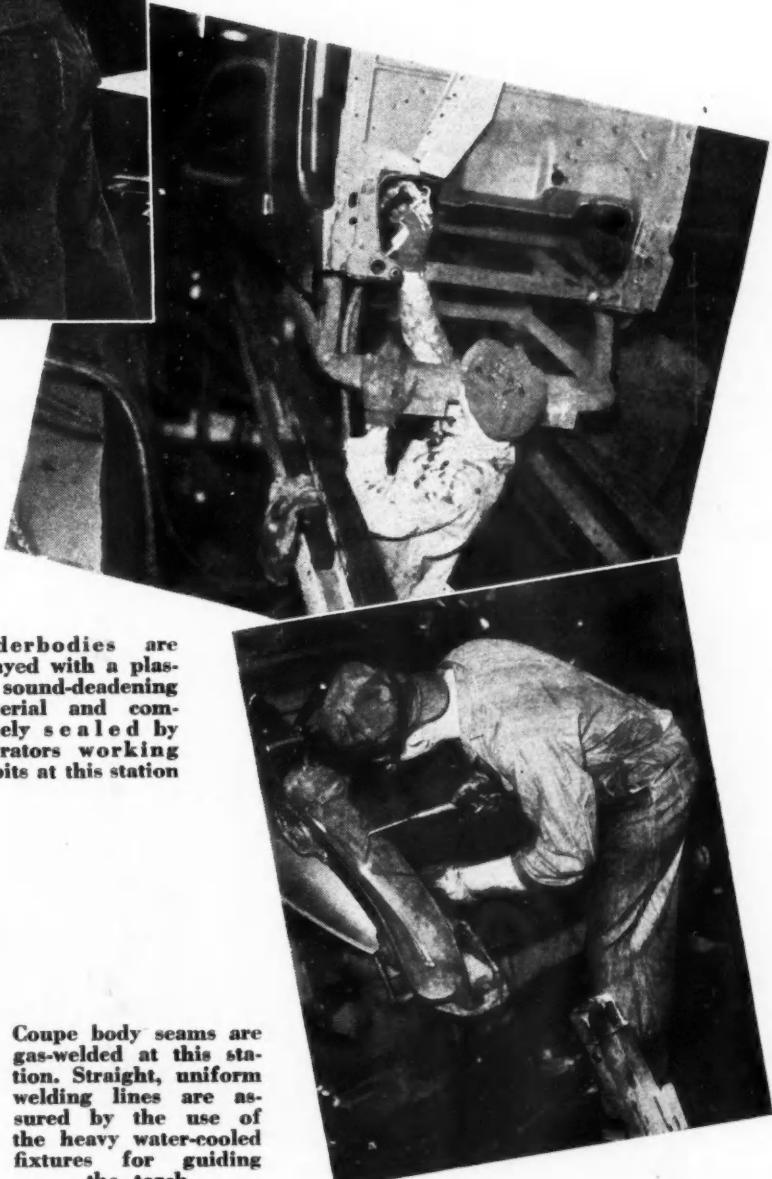
The new Olds body plant handles the production of sixes and eights and has a capacity of upwards of 1250 units per day. It may be described as largely assembly and finishing operation since no stamping work is done here. In general this plant is completely equipped for body assembly using the latest types of welding fixtures and welding techniques, metal finish lines with high cycle tools, paint, and trim. After the final inspection, bodies are transported to the Olds factory on the special double-tiered trucks which were described sometime ago.

Running through some of the high spots in the assembly department, we find that the bulk of the operations are performed by resistance welding

using bar welding and gun welding tools. The larger items of equipment are very flexible, consisting of massive steel framing jigs served by individual welding tools which enable a group of operators to work on one job simultaneously. The master framing jigs are so designed as to hold door openings and windshield alignment within precise limits.

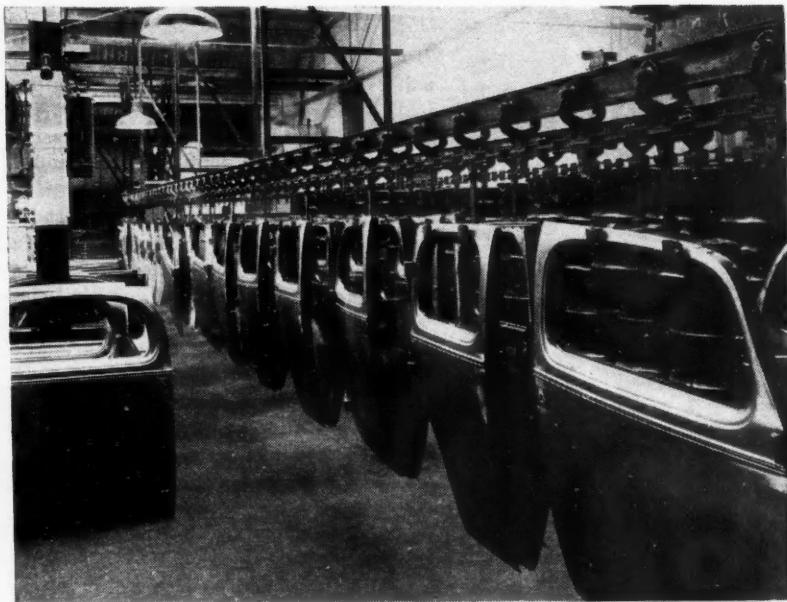
The gun welding tools used throughout are of the portable type with air pressure action and accurate timing control. Such tools on the master framing jigs are timed for 100 to 180 spots a minute, producing practically a continuous seam.

Gas welding with the oxy-acetylene torch is used at many points not readily accessible with resistance welding tools. In addition, gas welding plays a big part in the assembly of coupe bodies



Underbodies are sprayed with a plastic sound-deadening material and completely sealed by operators working in pits at this station

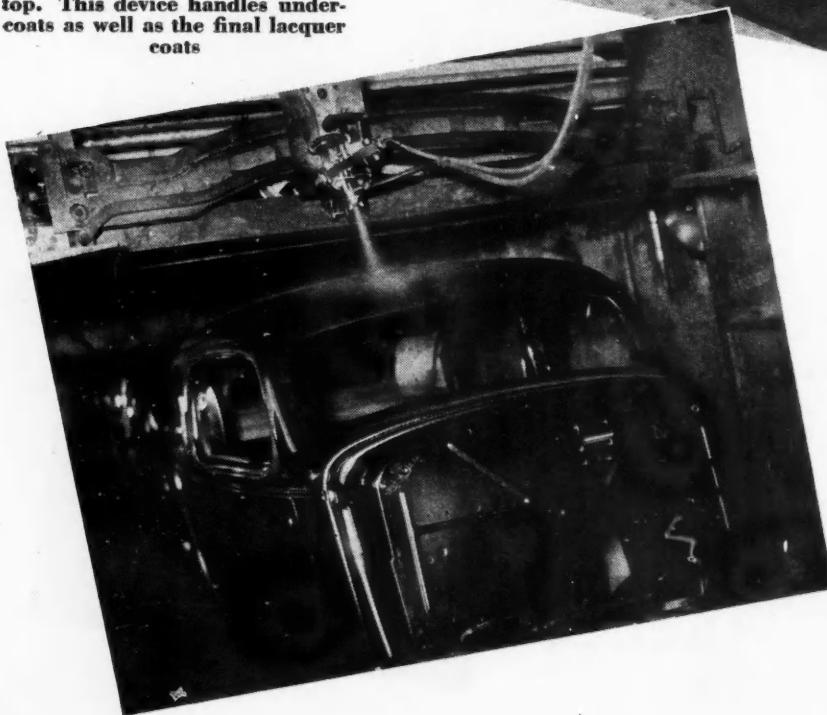
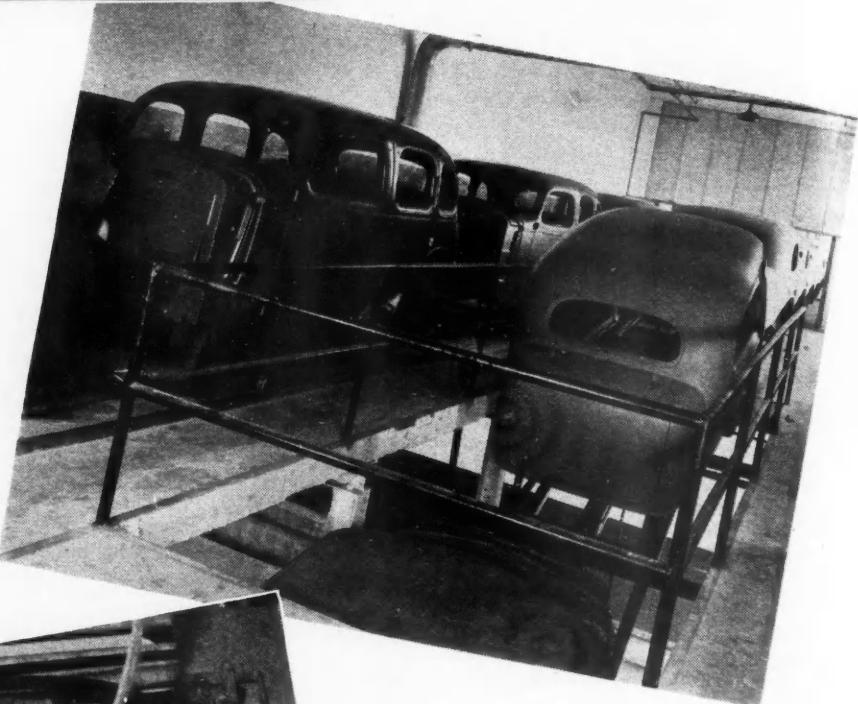
Coupe body seams are gas-welded at this station. Straight, uniform welding lines are assured by the use of the heavy water-cooled fixtures for guiding the torch



View of long monorail which feeds complete doors to the assembly lines

Going up! Assembled bodies coming up to the second floor for painting operations

Ingenious mechanical spray nozzle used for covering the turret top. This device handles undercoats as well as the final lacquer coats



where the long seams at the rear are finished with the torch. This operation is handled most ingeniously by the use of heavy, water-cooled fixtures which clamp over the ends of the body and guide the torch so as to produce a straight and uniform seam.

Following the assembly operations the bodies go through the metal finishing department in preparation for the paint shop. One of the most interesting operations immediately preceding paint is that of sealing the underbody not only underneath but at all the interior joints. This is done at a station provided with pits which enables the operators to work comfortably under the floor and facilitates the spraying of the underbody and all exterior joints with a plastic sound deadener.

The Olds paint job smacks of high quality in every respect. Each body takes three undercoats and six coats of lacquer, the lacquer content comprising no less than one to one and a quarter gallons of pure lacquer per body. Incidentally, lacquer usage is checked daily by comparing the total volume against the number of units produced. Eight standard body colors are used in regular production, piped from the Duco room in the basement directly to individual spray guns which are mounted in banks of eight at every color station.

The paint shop is very proud of one of the hidden operations, that of spraying an extra heavy spot spray undercoat on all edge areas to serve as a

(Turn to page 222, please)

The Horizons of Business

By Joseph Stagg Lawrence

The Thirty-Hour Week

THE frank alignment of an outstanding labor group with one of the major political parties, will make labor issues play an important part in future political campaigns. The most important issue that labor will inject is the Thirty-Hour Week. Therefore it is, pertinent to ask why this issue is raised and what effect its success will have upon business, upon the general welfare, and upon labor itself. There are two outstanding reasons for the emphasis upon the Thirty-Hour Week at this time.

Specific Accomplishment

The objectives of organized labor have always been simple. This simplicity has been a distinct strategical virtue. Working men organize in order to raise wages and improve working conditions. Hours are the most important condition of labor. It follows that the effectiveness of organization and leadership is measured directly by the progress made in reaching objectives. If a labor union can point to a rise in wages from fifty to seventy-five cents an hour, that is tangible evidence of its success. In the same fashion, if organization can bring about a reduction in hours the time thus cut from former schedules is a gauge by which dues paying members of the union can test the value of their officers. It is the precise nature of these gauges that causes labor leadership to emphasize the wage and hour objectives of labor. Only this fact can explain the currently greater emphasis upon wages and hours than upon such objectives as greater annual earnings, dismissal compensation and security.

Machine, the Culprit

The second reason for the prominence of the hour issue at the present time is the opportunity which it affords for plausible rationalization. It may be recalled that organized labor, in the years before the depression, was interested in shorter hours no less than it is today. At that time the case for reduced hours rested upon the physical

welfare and vitality of the working population. It was argued that the long week undermined the health of the worker and made him less able to devote desirable attention to his broader duties as a citizen. Furthermore, it was supposed to have an effect upon the ability of the working man to raise healthy offspring. Such was the nature of the case for the shorter work week before the depression of the thirties got under way.

The hard years through which we have passed, together with the highly active though short lived evangelism of the Technocrats, has given the case for the shorter week a much more effective though equally specious brief. The Technocrats rendered labor a great service by dramatizing the displacement of human services by the machine. The distressing increase in unemployment added emphasis to the demonstration of the Technocrats. The leaders of labor were not slow to seize the opportunity. The machine was responsible for unemployment. The increase in the mechanical capacity for production, reduced the demand for labor. The solution of this problem was obvious: Reduce the number of hours in the week and spread the available work among a larger number of toilers. This is the type of demonstration which lends itself readily to popular exposition and has been very effective in promoting the cause of the Thirty-Hour Week.

A Hollow Case

The open minded student of technological progress knows well that the two are not necessarily cause and effect. In certain instances, and at short range, the introduction of the machine resulted in eliminating workers. Over a period of time, and in a broader sense, we know from the carefully tabulated statistics of the Census Bureau that the progress of the machine age has resulted in jobs for a larger proportion of the population under more agreeable working conditions at higher real wages.

If the hypothesis of technological unemployment were correct, we would expect to find the greatest unemployment in those industries in which technological progress has been greatest and least unemployment in those fields where the hand of the machine age is least in evidence. Examination of the facts fails to support this inquiry. The automotive, oil and chemical industries are distinctly the product of the machine age and it is in these industries that we find the most striking applications of mechanical power. Yet the employment indices compiled by the Department of Labor show that there is a greater measure of employment in these three industries in terms of predepression averages than may be found in a fair cross-section of all business.

On the other side we may take the bricklayers, the masons and the carpenters. It may fairly be said of these trades that they are comparatively innocent of the mechanization which has contaminated other fields. It would seem, on the basis of the organized labor-technocratic-hypothesis, that we would find the least unemployment in these trades. Curiously enough, the precise contrary is the case. Our greatest unemployment is to be found in the fields that have "benefited" most from trade influence and the absence of technological progress.

Effects

What will be the effect of the Thirty-Hour Week?

1. It will constitute a challenge to management which in many instances it will be unable to meet successfully. American enterprise during the past century has gradually lowered the working week. In the pre-Civil War era a working week of seventy-two hours was the rule. This twelve-hour day and six-day week was gradually reduced until we had an average work week before the depression of a little more than fifty hours. There has been a further cut in the interval so that a return of normal business would probably find American industry operating on the average on a forty-six or forty-seven hour week. The program

(Turn to page 228, please)

Fifty Years of Aluminum

and the

THE early experiments on the "horseless carriage" must have been going on at just about the time young Charles Martin Hall was working on his process for the electrolytic reduction of aluminum. Certainly it is true that these two young industries — the automobile industry and the aluminum industry — have grown and developed side by side, both to become enterprises of great commercial importance. Each has contributed in considerable measure to the progress and prosperity of the other.

It may be interesting, on this 50th anniversary of Hall's first successful experiments, in which, with borrowed batteries and a home-made electrolytic cell, he succeeded in "producing some pieces of aluminum as large as pinheads," to trace briefly the story of aluminum in the motor car.

Although Hall first succeeded in reducing the metal in 1886, many painstaking years of experiment and improvement passed before the process reached a commercial stage which would allow its production in considerable volume at a reasonable price. In the early years of the present century, however, this had been accomplished and aluminum was available in quantity and was looking for a market. By this time the motor car had emerged from its own experimental stage and was about to enter its marvelous period of expansion, destined to revolutionize human activity and habits.

The first automobiles were extremely heavy. The engines were of large size and low power, and the construction excessively bulky throughout. It was necessary to fight weight at every turn in order to achieve a barely acceptable standard of performance. The aluminum alloy containing 8 per cent cop-

per offered a material with good foundry characteristics, generally capable of substitution for cast iron. This alloy quickly made a place for itself in engine construction and was specified by designers for many engine castings where its physical properties allowed it to be used.

In body construction the story was much the same, except that here aluminum sheet possessed the additional advantage of workability as well as lightness. The original bodies were made of wood, the curves being developed from great numbers of pieces cut on scroll saws, glued together and hand finished. In recalling the early applications of metal to bodies, it must be remembered that the deep drawing steel sheet and giant press equipment of today were unknown, and the ap-

sumption of aluminum to record levels and accounted at one time for somewhat more than 60 per cent of the total domestic production. However, the foundations upon which this huge consumption had been built were crumbling even as the records were being established. By the end of the war period the automotive engineer had so far improved the efficiency of his power plant that he could make it much smaller and therefore much lighter, and consequently was not pushed so hard by the weight problem as formerly. About this time, also, the old-style "two-piece" crankcase was giving way to the present cylinder and upper half cast-en-bloc construction. This was a further move in the direction of compactness and economy. It necessitated the use of cast iron on account of the cylinders.

On top of all this, the rapid expansion and high rewards in the industry had increased price competition and focused the best brains in the steel and equipment industries upon each individual production problem, with the result that it became possible to produce many parts — such as body panels, oil pans, housings and

covers — as steel stampings at a weight and cost which put cast aluminum out of the picture so far as the passenger car field was concerned, though, for reasons which will be discussed later, it remained pretty well entrenched in truck engines.

While all of this was going on, the engineers were finding that the improved higher-speed motors were presenting new and urgent problems for solution. The bearings would not stay in so well. This could be remedied, of course, by making them larger, but that made the motor larger and



The first plant for the manufacture of aluminum was that of the Pittsburgh Reduction Co., the forerunner of the Aluminum Company of America

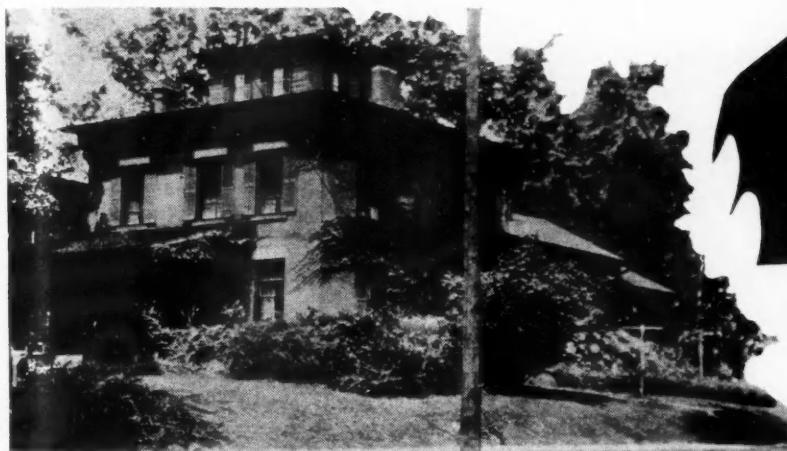
plication was largely a hand one in which the metal sheets were beaten or "bumped" into shape over wooden forms. Aluminum sheet was soft and lent itself to "bumping" to an extent that was impossible with steel. During this period, many cast-aluminum body panels were also employed.

As the automobile business expanded and prospered, it carried the con-

The Automobile Industry

By G. D. WELTY

Aluminum Company of America



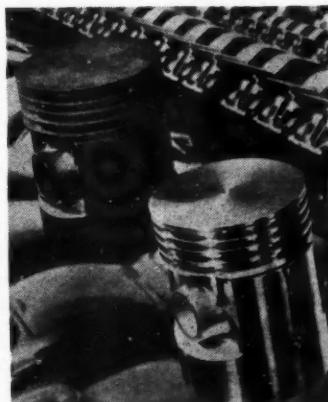
At the Hall home in Oberlin, Ohio, the old woodshed still stands where the early experiments were made and can be seen at the extreme right of the picture

heavier; also, higher speeds resulted in greatly increased inertia forces in the reciprocating masses, which set up objectionable "vibration periods," particularly severe in four-cylinder motors where an inherent condition of unbalance prevails. There appeared, moreover, to be a limit beyond which it was not expedient to increase compression ratios on account of excessive piston-head temperatures resulting in rapid carbon deposit with consequent overheating and "spark rap." All of these troubles pointed definitely to the necessity for a lighter and cooler-running piston.

Experiments with light-alloy pistons soon verified the practicability of their use. Vibration periods were greatly reduced in intensity, while the rapid build-up of carbon with its resultant evils was greatly reduced.

While the early castings left much to be desired from the standpoint of soundness and uniformity, these problems were solved with the introduction

of the permanent mold method of manufacture, by which sound close-grained castings could be produced in large numbers at relatively low cost and to a high degree of dimensional accuracy. However, one other diffi-



When but 22 years of age Charles Martin Hall discovered the electrolytic process for the production of aluminum

culty remained which dogged the aluminum piston throughout the early years of its development, until it was finally solved by a combination treatment involving a special alloy and design. The trouble resulted from the high coefficient of thermal expansion of the original piston alloys, which was about twice that of cast iron.

The early history of aluminum pistons was a continuous cycle of adopting in hope and discarding in disgust. The properties of high thermal conductivity and lighness were becoming so imperative, however, that the fight to solve the expansion problem was an unending one. Dozens of inventors poured forth literally hundreds of pat-

Pistons of aluminum have been the subject of much experimentation and considerable use

ents within a few years, all dealing with some scheme or other for overcoming the effect of high thermal expansion in the aluminum piston. The first of these schemes to attain any large degree of commercial success was the split-skirt design piston, in which the head of the piston was separated from the skirt above each bearing face by a horizontal slot, with a vertical slot provided in one face running from the horizontal slot to the open end of the casting. This construction allowed the piston to be fitted closely in its cylinder and rendered the skirt capable of flexing when expanded against the cylinder wall without seizure or scoring.

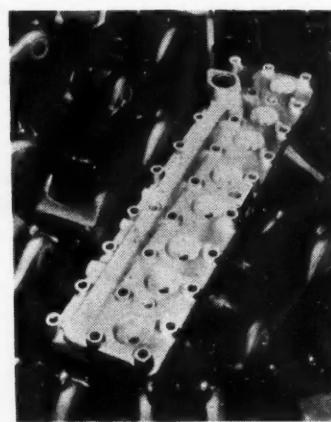
Another device which gained wide acceptance for a period of years was the method of controlling the expansion of the piston *internally* by casting in invar steel struts in such a manner as to act as spacers between the two bearing faces.

More recently, the problem has been attacked from the fundamental standpoint of reducing the expansivity of the metal itself. This was accomplished in the alloy which, when coupled with the semi-flexible "T-slot" design, produces a piston even lighter than one made of pure aluminum, possessing most excellent bearing characteristics. Cam grinding of the skirt controls unit bearing pressures within narrow limits throughout the range of speed and load. As a result of these improvements, the use of aluminum pistons has become very popular among motor car manufacturers.

The application of aluminum cylinder heads during the past few years is another logical result of intensive engineering effort to increase still further the power output of engines without increasing size. The aluminum cylinder head is the natural complement of the aluminum piston. Its use permits the employment of still higher compression ratios with a further increase in power output and fuel economy. Cylinder heads are necessarily complicated in design due to the many functions they must perform satisfactorily. Large temperature gradients resulting in local hot spots are detrimental to proper cooling and performance. The high heat conductivity of the aluminum head greatly reduces the magnitude of these gradients, thus tending to eliminate high temperature areas and opening the way for new levels of power output and engine efficiency.

As has already been implied, the use of aluminum in passenger car bodies, except for a few small applications, has been practically abandoned. In commercial vehicle bodies, on the other hand, it has received a considerable

impetus on account of the large economies which are to be realized by decreasing "dead load" and increasing "payload." By the use of aluminum, weight savings are effected, running all the way from several hundred to several thousand pounds, depending upon the extent of the application and upon the size of the body. In addition, the bodies are permanently anti-corrosive (except under a very few conditions) and their cost of upkeep correspondingly low. The increasing use of aluminum alloys in all types of commercial body construction, together with the advances made in methods of fabrication, including rolled and extruded shapes, welding, riveting, etc., is resulting in lower construction costs with consistent advances in quality.



Engineers have utilized the high heat conductivity of aluminum in the designing of cylinder heads for higher compression ratios

The foregoing remarks apply equally to the field of passenger buses, both city and interurban types, with the exception that here the weight savings are not generally usable in the form of additional payload, as the size of these bus bodies is seldom increased when aluminum is used. The reduced weight in this case is utilized to effect greater agility and to improve operating economy; in many instances, also, to keep the entire vehicle, with its payload, within highway weight limits.

To attempt any specific predictions as to the future place of aluminum products in the automotive industry is, of course, a risky business. The only thing which may be safely said is that its place, like that of all other materials, will be determined solely on the basis of economic justification. There is no industry in the world where the balance between cost and utility is so accurately and rapidly appraised, nor any where mistakes are more quickly uncovered by customers. No manufac-

turer can afford to specify any material for any purpose except the one which in his judgment presents the best balance between price and performance.

With the strong light alloys available today, and the improved methods of fabricating them, it would be entirely possible to "aluminize" a large part of the present chassis with a material weight saving of approximately 50 per cent as compared with the present standard chassis. This would include such parts as a forged front axle, cast heat-treated rear axle, strong alloy frame complete with all cross-bracing, gasoline tank, and most of the brackets and fittings. The engine would have oil pan, crankcase cast-en-bloc with wet sleeves, cylinder heads, connecting rods and pistons, as well as many small accessories. Numerous cars carrying all of these parts have been built and tested over many thousands of miles with excellent results.

The question as to the extent to which light alloy construction is likely to prove economically justified is far more difficult to answer, in that the answer depends upon factors, some of which are unknown and others difficult to evaluate. The trend of design would indicate an even more extensive utilization of aluminum cylinder heads.

It would appear reasonable to assume that forged aluminum alloy connecting rods, which have been used successfully by some of the leading car manufacturers, may come into further prominence as the problems of bearing loading and temperatures become more acute.

In body and chassis construction for pleasure cars, the future of aluminum will depend upon economic factors impossible to predict. As already stated, it is entirely possible and practical to effect large weight savings through more extensive light alloy applications throughout the car. This would, of course, result in a higher first cost, which would tend to be offset by lower operating costs. Here in America fuel is cheap and, in the case of pleasure cars, no very heavy tax penalties are levied by the Government directly against weight. Under such conditions, the matter of first cost is emphasized, while that of operating cost is pushed into the background. In Europe, however, these two conditions are reversed, with the result that great emphasis is placed upon light weight and low operating cost with relatively less upon original cost. Such considerations as these are likely to prove large if not controlling factors in manufacturers' future choice of materials for motor car body and chassis construction.

JUST AMONG OURSELVES

Position of Unions In the Industry

IN April of 1935 the Bureau of Labor Statistics of the U. S. Department of Labor began a study of company unions and of other types of employer-employee dealing. Results of the study published in a recent issue of the *Monthly Labor Review*, indicated that so far as the number of plants connected with the automobile industry is concerned, employees are still largely dealt with as individuals, without the intervention of a bargaining agency.

So far as the number of employees is concerned, a large majority is covered by bargaining through some form of union, indicating that complete "independence" on the part of management of automobile and allied plants is confined generally to the smaller plants. In the aircraft industry, in the majority of plants dealings are with workers as individuals, and the majority of workers in the industry are covered by this plan.

Here are the actual figures: In the automobile industry, the study covered 126 plants employing 70,437 workers. Of these plants 94 deal with workers individually, 14 with some or all workers through a trade union, 16 through a company union, and 2 through a combination of company union and trade union.

Aircraft Plants

More "Independent"

MORE significant, perhaps, are the percentages of the 70,437 workers included under the various plans. Here the breakdown is as follows: Only

15 per cent of the workers are dealt with as individuals; 39.5 per cent through company unions, and 25 per cent through company and trade union combinations. Of the plants which deal with some or all workers through trade unions it is estimated that 20.5 per cent of the workers are included and that of this 20.5 per cent, 16.7 per cent is covered by the trade unions and 3.8 per cent is not covered.

In the aircraft industry, 20 plants employing 7517 workers were covered in the study. Of these plants 15 deal with the workers as individuals, 1 with some or all of the workers through a trade union, 3 through a company union, and 1 through a combination of company and trade union. Coverage of workers by the plants is distributed as follows: 54.9 per cent is dealt with as individuals, 33.4 per cent through company unions and 10.2 per cent through the combination of company and trade unions.

Everyman's New Home-On-Wheels?

THE development of a "motor home" by William B. Stout will dramatize for many people who would not otherwise be reached the availability of trailers for passenger cars, by means of which may be provided for the traveler on the highway, all the comforts of home—or almost all.

The facts are (unfortunately they are not yet numerical facts) that the last year or two has seen a widespread development of public interest in "camp" trailers, some of them luxurious beyond belief. In a recent visit to Detroit we noticed a "used-trailer lot" sandwiched in among

the ubiquitous used-car lots of the Motor City.

In England, of course, "caravanning" has become one of the recognized outdoor sports, and the craze has spread to a certain extent in Germany. Considering the recent development of interest in skiing in the United States, with respect to the future of caravanning, we believe that anything might happen.

The Population Gains in Mobility

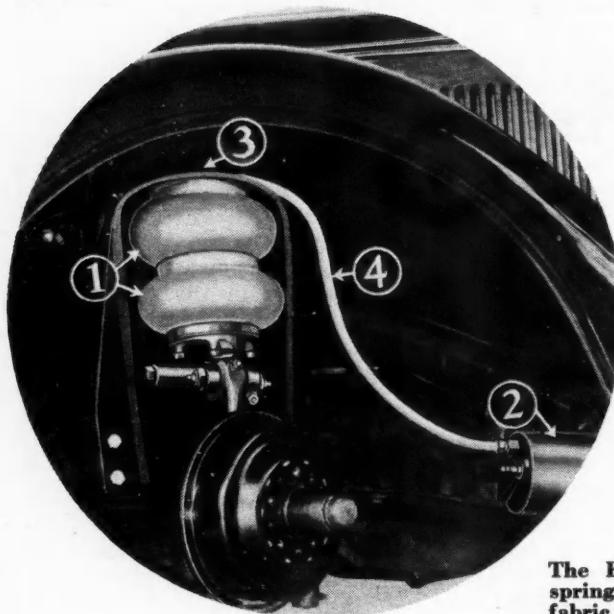
As many observers have pointed out, the population of the United States is becoming increasingly mobile. Some have gone so far as to say that this mobility will extend to housing, and that the house of the future, for a large section of the population, will be on wheels. The possibilities of this as a means of migrating from one job to another and from one climate to another as health or wealth dictate, are innumerable.

If such a condition comes about, it will have duplicated the progress of automobiles in this country from instruments of pleasure to necessary utilities, and if caravans do come into extended use here, we believe that utility will be the limiting factor, rather than pleasure.

Just as there are thousands of motorboat enthusiasts in our country who will never own a motorboat, it may surprise you to find that a number of your friends are secret devotees of the possibility of traveling around the country in a house on wheels. And as every motorboat enthusiast has his own ideas about how a boat should be designed and powered, people who travel in trailers are full of ideas about how they could be redesigned to add just a few inches of space—just a few more comforts.

This last, we believe, will keep the budding caravan industry from ever growing up to a real mass-production basis. Production will probably be scattered among scores of manufacturers, each of whom offer many options of design and equipment and price.

—H. H.



The Firestone air spring: 1. Rubberized fabric bellows; 2. air reservoir; 3. pendulum valve; 4. metal tubing

A NEW chassis suspension known as the Firestone Air Spring has been introduced by the Firestone Tire & Rubber Company and is illustrated by the accompanying photograph as applied to front-wheel suspension. The air spring consists of a specially developed rubberized-fabric bellows, 1, which is inflated with air to carry the desired load. The bellows operates automatically in conjunction with an air reservoir 2, by means of a pendulum shock-absorption valve 3. Bellows and reservoir are connected by a metal tube 4. Following are the advantages claimed for this system of suspension by the manufacturer:

1. It provides easier riding, with less fatigue to the passengers.
2. It practically eliminates body roll when rounding corners at high speed.
3. Shock control minimizes the effect of road irregularities on the passenger.
4. It provides facilities for controlling the softness or riding quality.
5. It provides more nearly quiet operation.

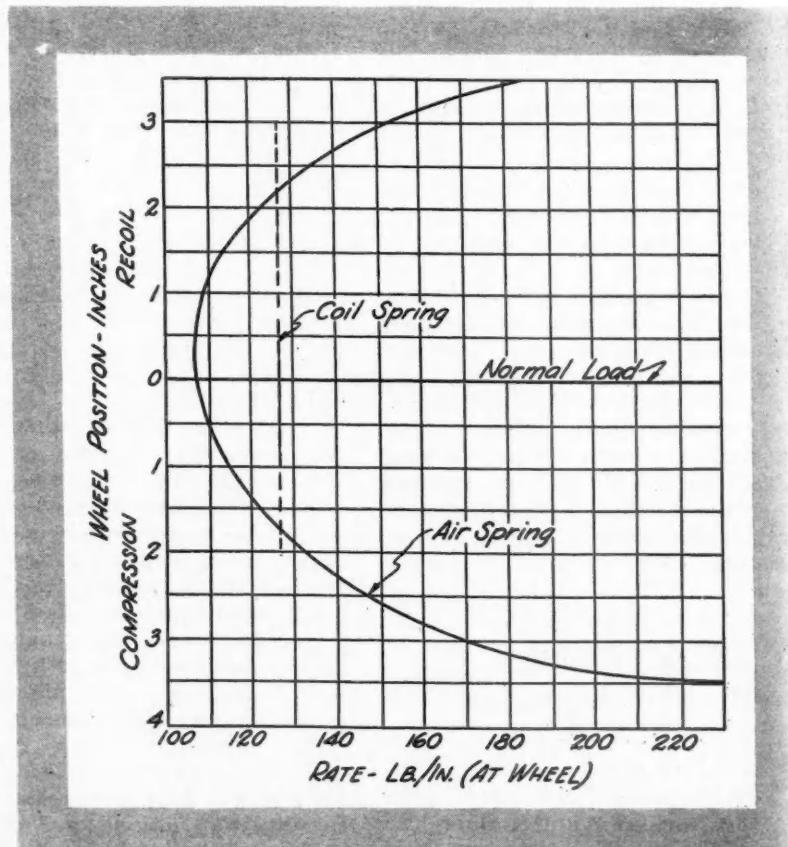
Some of the work done in connection with the development of the new air springs was covered in a paper which was presented at the recent annual meeting of the S.A.E. by R. W. Brown, in charge of research engineering at the Firestone Tire & Rubber Company, and the following information is taken from Mr. Brown's paper.

The problem consisted in evolving a simple, practical means of carrying the total load on low-rate air-inflated bellows with self-contained shock-absorb-

Firestone Air

ing and anti-rolling properties. The development of a suitable bellows proved a problem of no small magnitude. That success was achieved in the solution of the problem is attested by the fact that one of the bellows withstood eight million 2-in. deflections under 25 per cent overload.

Since the forces to which the passenger is subjected when the car passes over road irregularities are dependent on both the spring rate and the friction, and in some of the low-rate suspensions now in use the friction approximates the spring rate, reduction of friction becomes a very important matter. For a good boulevard ride a very soft spring (low spring rate) is required. At higher speeds and over rough roads considerable wheel movement is required, and the ideal suspension for both conditions is one in which

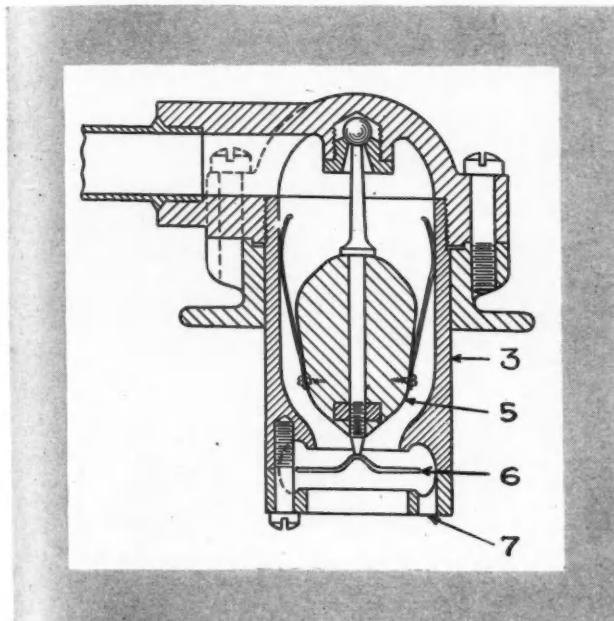


Variation of rate of air spring with compression, and constant rate of equivalent coil spring

Air Spring Aims at a Smoother Ride

the spring rate increases with the distance from the normal position in both directions, that is, both on compression and rebound. The air spring was designed to approximate this condition. Rate characteristics for a conventional coil spring and for the air spring are shown in one of the drawings reproduced herewith. The design of the bellows can be changed to provide higher or lower rates as desired.

A distinction is made between the "static" rate and the "dynamic" rate



Pendulum valve controlling spring damping and body sway

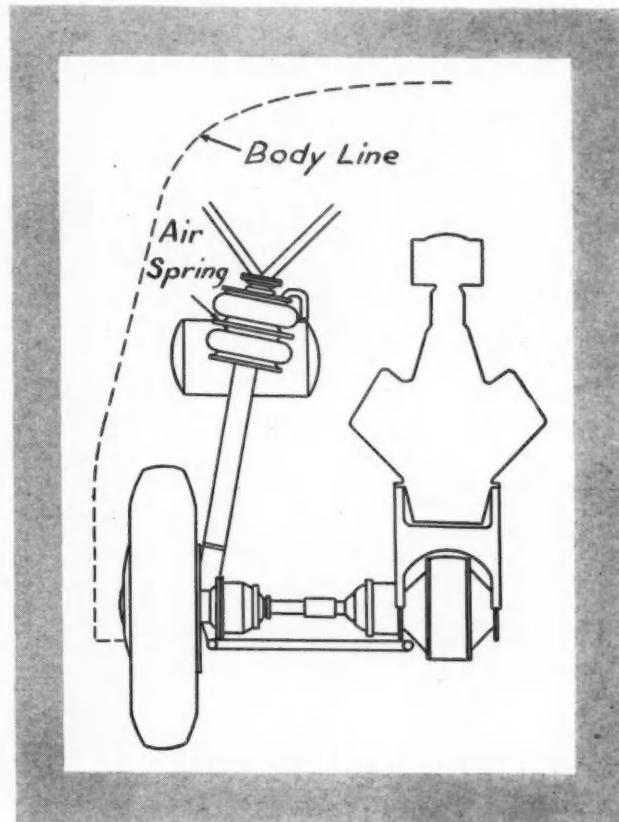
of the air spring. The former, which is the rate determined by adding load to that already on the spring and then measuring the deflection produced, is dependent on the size of air reservoir used with any particular bellows. It will be readily understood that if there is a sudden change in the load on the air spring, the effective rate is influenced by the fact that the communicating passage between bellows and reservoir is of relatively small cross section. The area of the connecting passage, moreover, can be varied either automatically by an inertia-controlled valve, or manually.

In the air spring, damping of the

spring motion is effected by valve, 3, between the bellows and reservoir. A diagrammatic sectional view of this pendulum valve is shown herewith. The disk, 6, permits free air flow from the bellows to the reservoir, but restricts the return flow through ports, 7, as desired.

The comfort of the passenger is dependent on the frequency of body oscillations, which in turn is dependent on the rate of the suspension and the suspended mass.

What has been regarded as the ideal frequency has come down year after year. Some years ago, when the body frequencies resulting from the suspen-



Mounting of air spring on Stout Scarab car

sions then used were in the neighborhood of 140, a frequency of 126 was thought to be ideal. At present some of the lowest rate suspensions result in body frequencies of from 90 to 110, while 60 to 80 is considered ideal. With true aperiodic damping there is no succeeding cycle. Hence there is no frequency, as the displacement from road irregularity, or other cause is limited to one cycle. This probably accounts for the fact that the larger amount of correct type damping used in initial experimental installation of the air spring on cars lacking today's weight distribution and stiff frames produced appreciably superior results in the rear seat ride.

When the car passes around a curve, centrifugal force acting on its center of gravity tends to displace the body along a line extending radially outward from the center of the curve, causing

what is known as body sway. This swaying action has been reduced in some conventional suspensions by installing a torsion stabilizer either at the front or the rear. Unfortunately, such a torsion stabilizer definitely increases the effective spring rate when wheel action is unequal on opposite sides of the car, which is usually the case.

In the air spring the cornering problem is dealt with without changing the effective rate of the springs. Re-

ferring to the sectional view of the pendulum valve, a vertical pendulum, 5, is mounted in the valve, 3, so as to swing outwardly when rounding turns. This permits valve disk, 6, to close the passage to the reservoir, which increases the pressure in the bellows because of additional load due to the centrifugal force which develops when the car is turning. This prevents the car body from unduly inclining toward the outside when taking turns at relatively high speeds.

One of the illustrations shows the application of the Firestone Air Spring to the rear suspension of the Stout Scarab car. In this case a combination of a low spring rate with high load capacity was required. This calls for very strong damping. It will be seen that in this application the air spring is mounted in a high location, which in itself reduces the swaying tendency, and it was stated in Mr. Brown's paper that this installation had resulted in phenomenal stability.

Attention to Quality Paramount at Olds Body Plant

(Continued from page 214)

protection against thin coatings at corners and edges.

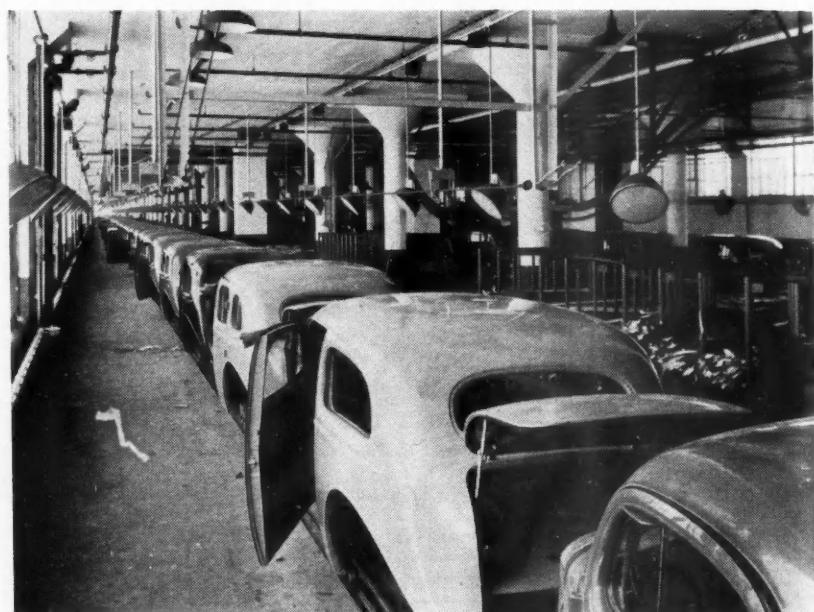
For the comfort and protection of spray booth operators all spray booths are of special construction embodying downdraft ventilation and provided with an effective exhaust system which removes all fumes and odors. In similar fashion, the welding fixtures in the assembly department are fitted with an exhaust duct which draws out dust and fumes and makes things much more comfortable for the welders.

Bodies proceed to the trim shop after the final inspection in the paint shop. Then after trimming, they are routed back to a special division of the paint shop for touching-up, striping, and final polish. Striping and other fine details are handled by female operators.

Prior to painting the bodies are acid washed and then washed down with a neutralizing solution.

All stations and assembly lines in this plant are equipped with the new G. E. high-intensity mercury vapor lamps of the latest type. This produces excellent illumination without glare, and serves to relieve the operators of

eye-fatigue with a consequent improvement in productivity and quality.



View of one of the long assembly lines in the trim shop

Handbook of Chemistry and Physics

A NEW, twentieth edition of its Handbook of Chemistry and Physics has been published by the Chemical Rubber Publishing Co. of Cleveland. It is 22 years since the first edition of this handbook appeared, and bringing out a new edition almost every year has made it possible to keep the information up to date. Chas. D. Hodgman, M.S., associate professor of physics at Case School of Applied Science, acted

as editor in chief and had the assistance of thirty-eight collaborators.

A large table of physical constants of organic compounds, which has been a feature of previous editions, has been greatly enlarged in scope and changed in form. A new nomenclature has been worked out for the compounds listed in the table, in accordance with the rules laid down by the International Union of Chemistry. More than 5500 organic compounds are now included in this table.

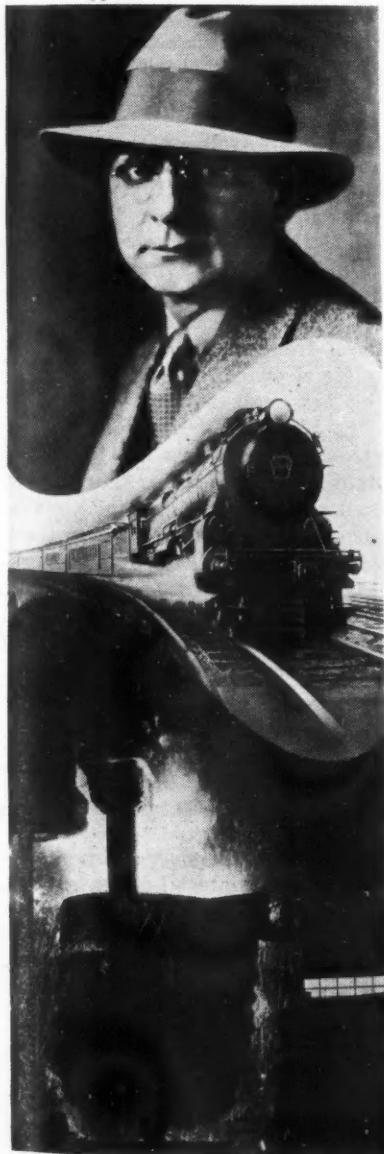
Another feature of the new edition

is a list of chemical terms with pronunciations recommended by the Committee on Nomenclature, Spelling and Pronunciation of the American Chemical Society. In a Formula Index of Organic Compounds these compounds are listed according to their empirical formula.

Sections have been added on Rules for Naming Organic Compounds, Prefix Names of Organic Radicals, and Properties of the Amino Acids. The section on X-Ray Spectra has been revised. A table has been added of Verdet's magneto-optic rotation constants. The section on Colorimetry has been enlarged.

It is hardly necessary to emphasize the practical character of a book that passes through nineteen editions in twenty-two years.

SUCCESS STORY



IN the countries where dictators operate, there is room for only one self-made man—the Mussolini, the Hitler, the Stalin. In America, it is still true that the American system of enterprise finds room for thousands of men to rise according to their ability. If we permit the loss of this heritage we lose in a large part the spirit of America.

The automobile industry is particularly prolific in the number of its high executives who have reached the top through sweat and sacrifice. Everyone knows about the rise of Ford and Chrysler. Here is another story, paraphrased from the words of the man himself.

He was born in Pittsburgh. His father was a locomotive engineer on the Pennsylvania Railroad. There wasn't much money for schooling and amusements had to be worked for. The boy who was to become a master salesman worked hard at a score of different jobs, and finally found his natural outlet. This is where many stories end.

But as every successful American knows, this was the beginning. Success brings the necessity for hard study of new material, new sacrifices to be made. There isn't time to do all the things one might wish. These things became apparent—to Roy H. Faulkner—as to many another man.

The door to American opportunity is not closed. But the incentives to success can be removed by legislative encroachment—whether it be subtle or open. Let's keep the way open for the American system to flourish.



I.H.C. Bids for Retail Milk Deliveries

ABOUT three years ago the International Harvester Co. announced a new house-to-house delivery truck, Model M-2, which was specially adapted to retail milk delivery. This has now been superseded by the Model M-3, which, in addition to being more attractive in appearance, incorporates many mechanical improvements, including hydraulic brakes. Radiator, hood, cowl and fenders of the M-3 are of the same general design as the corresponding parts of other Internationals. Many of the parts of the M-3 are interchangeable with the corresponding parts of the M-2, which will simplify the service problem where trucks of the new model are added to fleets of the older one.

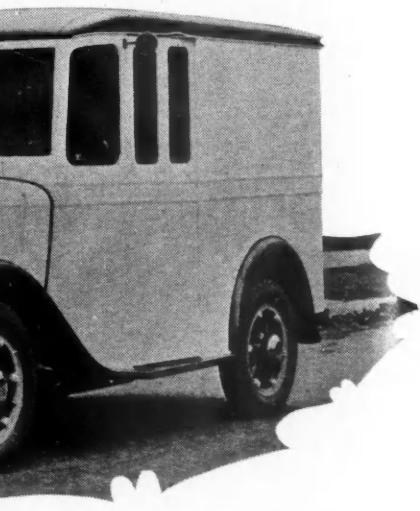
The M-3 has a specially designed chassis comprising one-piece side rails, a four-cylinder, L-head engine of 3½-in. bore by 4½-in. stroke; a low-speed, high charging-rate generator; a double disk clutch which can be controlled either directly or through the medium of a vacuum cylinder; a heavy-duty transmission with four forward speeds and reverse; a full-floating rear axle with drive shafts of chrome-molybdenum steel, and two-stage, semi-elliptic springs with semi-elliptic auxiliary rear springs.

Service brakes on the Model M-3 are of the hydraulic type and act on all four wheels; they embody the duo-servo principle, whereby the momentum of the vehicle assists in the braking. The

parking brake is entirely independent of the service brakes and acts on the propeller shaft behind the transmission.

The four-cylinder powerplant develops 41.5 hp. at 2400 r.p.m. and a maximum torque of 125 lb-ft. at 1000 r.p.m. The vacuum clutch control provides completely automatic clutch operation. The clutch pedal and conventional hook-up are retained, and the driver may change over to conventional control by pulling out a control button on the dash. In operation with the automatic clutch the driver's left foot is left free.

Ability to turn sharply is an essen-



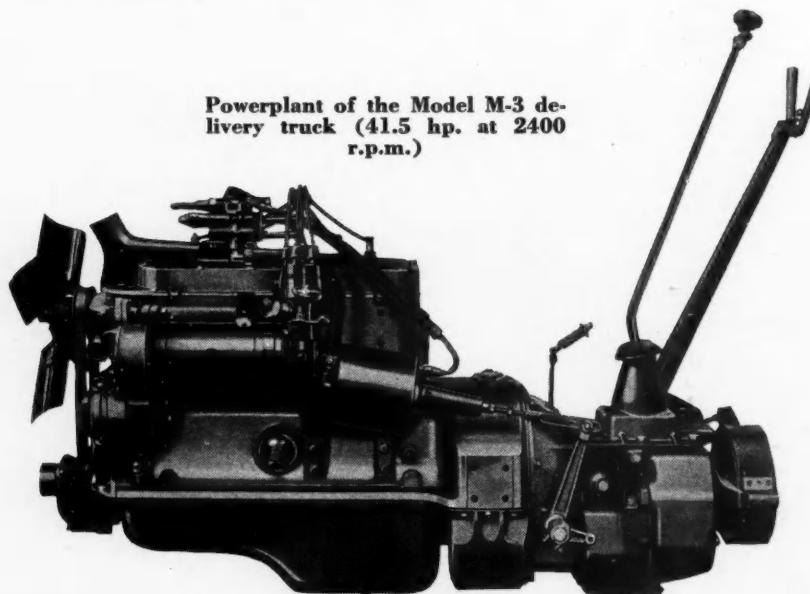
International Model M-3 door-to-door delivery truck with standard milk-delivery body

tial in a truck of this type. The turning radius (with fender and body clearance) is 21 ft. 3 in. to the left and 19 ft. 6 in. to the right. Standard chassis equipment includes 6.50-20 balloon tires in front and rear, cowl and dash, front fenders, front and rear bumpers, and complete electrical equipment.

The new milk-delivery body has a capacity of 42 cases. It is of composite construction, the frame being of straight-grained, selected hard wood, covered with sheets of masonite, which, in turn, is covered with 24-gage, cold-rolled sheet steel. The body floor is assembled so as to provide an air space between adjacent boards, and all floorboards are heavily primed before the rust-resisting, 20-gage sheet-steel floor is attached. Drain pipes are located in the floor at the front corners of the milk compartment, and four steel wear strips protect the steel floor. The roof bows are rigidly secured to the top side rails and covered with masonite, which, in turn, is covered by heavy-duty, black top material which extends down over the roof quarters and is secured by an aluminum drip molding.

The windshield is of safety glass, and a ventilating-type window, 12 x 23 in., is located in each front quarter. The front-door opening, 25½ in. wide, permits free access to the driving compartment. Front doors are of jackknife construction and when opened

Powerplant of the Model M-3 delivery truck (41.5 hp. at 2400 r.p.m.)



with Special Door-to-Door Models

fold snugly against the outside of the body toward the rear and rest on rubber door checks. These doors are hung by continuous piano-type hinges, and the operating mechanism, with control levers conveniently located on the front door posts, permits the driver to open and close the doors easily. Each front door has two windows 8 9/16 x 25 1/2 in. in size.

The two rear doors, each 15 in. wide and 57 in. high, facilitate rear-end loading and unloading. These doors fold back against the rear of the body, but do not extend beyond the sides, thus permitting side-by-side platform loading. Rubber door checks prevent the doors from marring the finish when they are swung open. Windows in the rear doors are of wire-reinforced glass. The left rear door is latched at the top on the inside. The right door latches at both top and bottom, the mechanism being operated by a chromium-plated handle.

The M-3 body is available also with wider rear doors (28 1/2 by 57 in.), and with standard-width rear doors and an extra window in the back panel on each side of the doors.

The driver's seat may be swung clear of the driving compartment when not required. A large, black, baked-enamel cowl tray is provided for order books and papers. The tool box is conveniently located on the left-hand side in front of the wheel housing and under the case rack. To insure against shifting of cases in the loaded truck, two removable case bars are provided, which when not in use are carried in hangers on the sides of the body.

Standard body equipment includes an electric windshield wiper, a rear-vision mirror, an adjustable sun visor, and a dome light.

As a special feature the Model M-3 body may be secured insulated. This refrigerator body has a capacity of twenty-four 12-bottle cases. The refrigerated compartment, which has 3 in. of cork-board insulation on top, sides, and back, is built into the body. A space for cases of empty bottles is left below and above the refrigerated compartment. The roof has a 1-in. layer of insulating material. In this special insulated body there are no side windows or rear doors. Four insulated refrigerator-type doors, two of which open upward and two downward,

lead to the refrigerated compartment. Leading from each door is a set of racks along which the cases are slid in and out. The bunker for the refrigerant is mounted on a conductor plate which forms the ceiling of the refrigerated compartment.

Another new house-to-house delivery model of International Harvester Co. is the Model C-5, a half-ton unit available in wheelbase lengths of 113 and 125 in. The 113-in. wheelbase chassis, including gasoline, oil, and water, weighs 2100 lb., and the long-wheelbase chassis, 2145 lb. The maximum carrying capacity, including body, cab, pay load, and equipment, is 2100 lb.

With the exception of the engine, axle ratio, and other minor differences, this model is similar to the International six-cylinder Model C-1 half-ton unit. The engine is of the four-cylinder, L-head type of 3 1/4-in. bore and 4-in. stroke, with a piston displacement of 133 cu. in. It has a compression ratio of 6 to 1 and develops 33 hp. at 2600 r.p.m. The engine develops a maximum torque of 90 lb.-ft. at 1200 r.p.m. The mounting is of the four-point type, with rubber-cushioned front and rear supports.

The clutch is of the 9-in., single-plate type with built-in vibration damper. The transmission has three speeds forward and one reverse, with silent second and high speeds. Transmission reductions are 3.053 to 1, 1.481 to 1, and 1 to 1 in forward gears and 3.707 to 1 in reverse. Final drive is by spiral gears to a semi-floating rear axle, with an axle reduction 5.11 to 1.

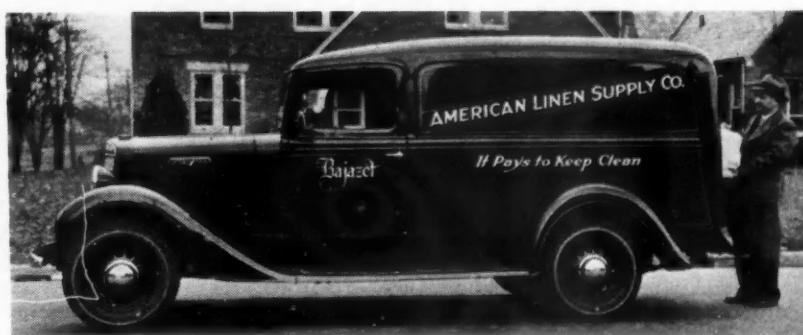
Equipment available for the Model C-5 includes a cab and pick-up, panel,

and canopy-top bodies for both wheelbases, as well as the Type CM body for milk-delivery service.

The International Type CM body is designed to handle 25 to 30 standard milk cases and is available for mounting on the 113-in. wheelbase models. It is of composite construction, with heavy, hardwood frame, well reinforced, covered with 20-gage auto body sheet steel applied over masonite panels. The inside of the body is slatted to protect the body sides. The body floor and wheel houses are covered with 18-gage galvanized steel. Angle irons prevent shifting of cases, and drain holes are located in both front corners.

The body roof is constructed with rounded-edge ribs covered with a smooth-finished material, over which a layer of blue wadding is placed and in turn covered with waterproof rubber deck material. Side doors leading to the driving compartment are 25 in. wide and 66 in. high. These fold in the center on continuous piano-type hinges and have slam-type anchors which hold them against the outside of the body when open. The double rear doors, each hung on three heavy hinges, provide a 32 x 55-in. opening. These fold back against the back of the body, but do not extend beyond the sides, thus facilitating rear-door platform loading.

Standard equipment includes the pedestal seat, so constructed that it is easily turned, thus allowing ample room to load or unload from the left side of the body; safety glass throughout; an electric windshield wiper; an adjustable outside rear-view mirror, and a dome light.



The C-5 is a half-ton unit for door-to-door delivery with a choice of 113-in. or 125-in. wheelbase

Twenty-seven Pistons per Hour Completed in Five Operations

ONE of the most interesting of the recent applications of the Ex-Cell-O Precision Boring Machine is the double-end machine recently installed in the plant of the Caterpillar Tractor Co., Peoria, Ill. Here is a flexible unit specially tooled for finishing aluminum pistons for a Diesel tractor engine. It handles five operations—turning five ring grooves, facing the dome, facing the spherical radius in the dome, turning the piston O.D., and boring the wrist pin hole—in one setting. Productivity is 27 complete pistons per hour at 85 per cent efficiency.

Carboloy tools are used for turning the ring grooves; diamond tools are employed for turning the O.D., facing the dome, turning the spherical section, and boring the wrist pin hole.

The station at the right end and at the back turns the five ring grooves and faces the dome in the same operation. The station in front and at the same end faces the spherical radius simultaneously with the above operations. After these operations are completed the table moves to the opposite end of the machine where the back station finish-bores the wrist pin hole and the front station turns the O.D. of the piston to the proper taper. The two latter operations are also performed simultaneously.

In the ring grooving and dome facing operations at the back and to the right of the machine, the piston is mounted on the nose of the boring spindle and held in place with a draw bar operated by a foot valve at the front of the machine. After the table moves to this end of the machine and comes to rest at a predetermined position a hydraulic cylinder advances a tool block with the facing and grooving tools. After these operations are completed the hydraulic cylinder automatically withdraws these tools and the table is ready to return to the opposite end of the machine to complete cycle.

At the front and right end of the machine a piston is supported on the nose of the boring unit as at the back station. The spherical radius facing tool is mounted on a hydraulically oper-

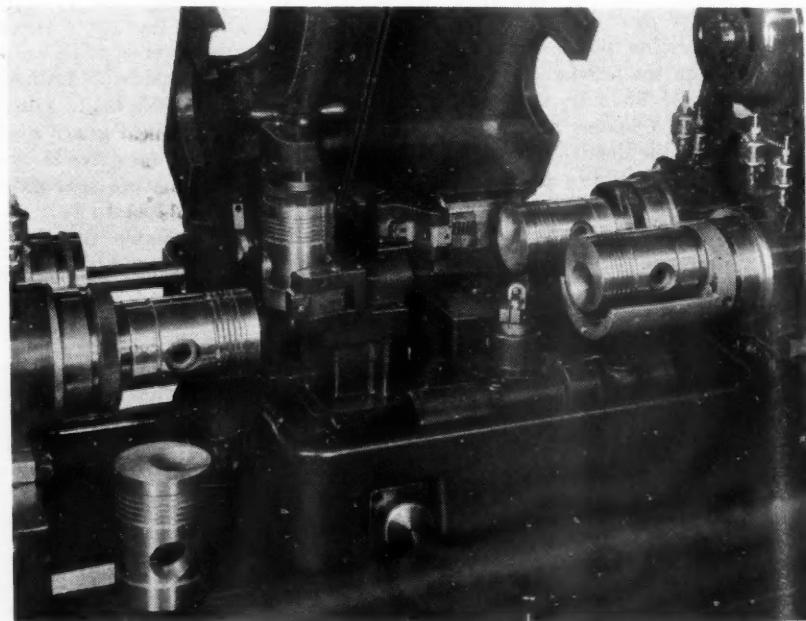
ated tool block having a rotary motion. Separate hydraulic cylinders operate the tools at each station and they are so timed that the respective operations are completed and the tools withdrawn from the work before the table carrying the tools can be returned to center of the machine.

The machine table then advances to the left end of the machine where two pistons have been loaded while the operations at the right end were being performed. At the back station, the piston is placed in a vertical position and correctly positioned with the boring spindle by a pin inserted in the wrist pin hole and manually operated aligning fingers located on the fixture table. The piston is then clamped by an equalizing plate on the dome of the piston, the aligning fingers are released swinging clear of the work and the pin is removed from the pin bore. The

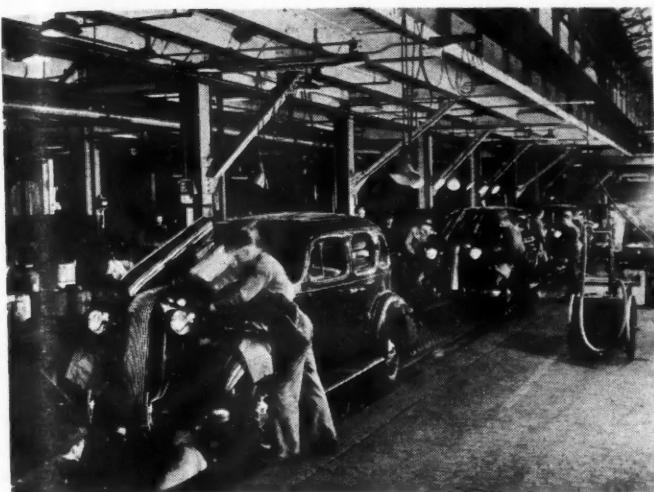
piston is then ready to be finish-bored.

At the front station a piston is mounted on the nose of the boring spindle as previously described and the tool block supporting the turning tool is hydraulically actuated. The boring unit is placed at the desired angle so that the proper taper is turned on the O.D. of the piston. After the entire surface of the piston has been turned the tool is withdrawn so there will be no tool marks across the surface of the piston as the table returns.

These two stations just described are also hydraulically interlocked and upon the completion of both operations the table returns to the center of the machine and comes to rest. While the parts were being finished at this end of the machine, the operator has had time to unload and reload the two stations at the opposite end of the machine eliminating the loading time.



Ex-Cell-O precision boring machine used to make pistons for the Caterpillar tractor engines. The station at the right end back turns the five ring grooves and faces the domes in the same operation. At the left end the wrist pin hole is finished and the outside diameter turned



The final assembly line at Pontiac. In the foreground is the last operation before the inspection department OK's it for shipment.

Synthetic Resin

Since the beginning of 1936 production Plymouth has been using synthetic resin finish on bodies and outside sheet metal and has abandoned lacquer entirely. This has meant the addition of some induction-heated furnaces, one of which is used for baking lamp body finish. Then, too, the use of synthetic has resulted in the temporary abandonment of the overspray paint salvage which we described so completely last year. Their experience with lacquer, however, will help to guide them to a salvage method for synthetic overspray.

Air Springs

Quite a stir has been created by the air spring suspension that was disclosed to the SAE by Firestone. Indications are that some of the car makers have been looking it over for some time, surely long before the paper was read. Just along this line, we were told several days ago by a man who is following spring suspension developments that some one in these parts is experimenting with a springless design, depending entirely upon the cushioning effect of doughnut tires. Evidently there is much in the wind so far as spring suspension is concerned.

Broaching Again

Over at Plymouth, Ed. Hunt has toolled up at least ten different operations for surface broaching. In addition to those applications with which you are familiar—notably connecting rods, bearing caps, and bearing locks—they have just added a broaching set-up for finishing the gasket faces on the manifold flanges, also a number of odd

operations. Incidentally, Cincinnati has just delivered a brand new, shiny machine to replace the first bearing lock machine used in the industry, which Plymouth placed in operation at least three or four years ago.

Stops Cracking

Several days ago we had spent a pleasant hour with Dr. Edward Sokal, a chemist known to many in these parts. Based upon an independent theory concerning the events that occur during detonation, Sokal offers a unique solution. He holds patents on a refractory paint which is applied on the surfaces of the combustion space—cylinder head, piston dome, and valves. This coating is painted or sprayed on, and sets from the engine heat. The coating—Kalmite—is made in two forms, a physical coating, and a chemical coating, neither is catalytic. The first is an intimate mixture of a binder and finely divided low melting metals such as lead, antimony, etc. The second is a mixture of a binder and certain insoluble carbonates.

The function of both coatings is to introduce selective cooling of the combustion chamber and this effect takes place only during periods of detonation when the temperature rises sufficiently to activate the coatings.

We are told that a number of important organizations are investigating the virtues of these coatings. We are passing on this information to you for what it may be worth.

Putt'n' On

Speaking of tire assembling, we find that Plymouth with all its daily volume can keep up with schedules by making

PRODUCTION LINES

the assembly manually, without the aid of a machine, but literally as quick as a wink. The trick, as we see it, lies in a bracket which supports the wheel—nothing special about the bracket except that it's inclined at the right angle to the operator. Another thing they do is to daub the edges of the tire carcass with a watery soap solution which makes the edges just as slippery as an eel. The upshot of it is that a couple of men can assemble an awful lot of tires in the course of a day.

New Wrinkle

The Seaman Paper outfit has created quite a stir in automotive circles with the introduction of Seapak tufting base. You take a thick soft pad of Seapak, back it with board, stretch upholstery material over it, and stitch any design you want. Already three different models of one make have adopted this construction for interior trim on doors and side panels. It produces a soft, luxurious effect in a tufted pattern that can equal any expensive coachwork—except that it's cheap enough to go into even a low-priced job. Those of you in the body business better keep an eye open for this development.

Better Finish

Speaking of engine main bearings, there is a decided trend to finer finish of crank journals. Although equipment for polishing and lapping these surfaces has been available for some years, many more engine builders are beginning to utilize the process. And refinements in the machines are now in evidence. The last word in crank journal lapping machinery may be seen at the Pontiac plant. Considering the fact that main bearings have been finished by diamond for a long time, it is but a logical step to polished mating surfaces on the crank.—J. G.

MANUFACTURING
MANAGEMENT
METALLURGY

The Horizons of Business

(Continued from page 215)

of the American Federation of Labor would force a violent and an immediate adjustment downward from this level to thirty hours. The problem of adapting production schedules to such a week is extremely serious. The chaos resulting from the compulsory and universal application of such a week has certainly not been honestly contemplated either by the politicians or the leaders of labor.

2. With labor on a Thirty-Hour Week, refusing to accept with this reduction in hours a cut in wages, the labor cost per unit of production must increase. It is not a sufficient answer to this point to say that labor will have increased buying power and that this will in some vague way offset the higher costs. According to the labor leaders, the working men will not receive any more wages over a period of time. In some industries, adjustments will be possible, which may maintain production at current levels without material increase in costs. In general, however, it is certain that the application of the Thirty-Hour Week will reduce the aggregate real national dividend which is distributed to the American people in the form of a living standard.

3. A compulsory Thirty-Hour Week will, in every industry where it is at all possible, result in accelerated mechanization. The higher cost of labor and reduced hours will be a challenge to the ingenuity of every management to adapt itself to this new restraint by

investing in more labor saving machinery. This will tend to defeat the very purpose for which the Thirty-Hour Week has been imposed.

4. It is difficult to see how it would be possible to apply universally this shorter work week. One dreads to think of a Thirty-Hour Week in hospitals, on the farm, and in the vast areas of personal service. Just how can labor in these fields be adjusted to a Thirty-Hour Week? If this is impossible, shall we assume that organized labor will be content with a Thirty-Hour Week for a selected and favored minority and abandon it for the great majority of workers? One or the other of these two alternatives must be embraced. They are the only alternatives.

5. In any given state of industry the amount produced is a direct function of the time spent in production. In other words, outputs vary directly with the number of hours of work. With the application of the Thirty-Hour Week, the conclusion is inescapable that a serious decline in production must accompany it. This is deliberate, and to the extent that it is designed, planned scarcity. It must lead inevitably to the less abundant life accompanied by greater idleness. We know of no more mischievous combination than a cut in the food, clothing and services which satisfy human wants and an increase in the leisure time available for the contemplation of this inadequacy.

when demand for this type of car is at its lowest ebb. What the net effect of the fall show will be is as yet conjectural.

"In the distribution end of this industry the motor vehicle retail trade dealers suffered from competition among themselves caused by competitive bidding on the used car which as a rule is taken in trade and accepted in lieu of money as part payment on a new car. Dealers operating with an overhead incurred during the flush years were forced to meet expenses on less than one-third of the former total volume of sales and in certain instances were faced with, especially in urban areas, an increase in the number of competitors handling similar makes of cars. The 'used car problem' and the 'factory-dealer relationship' were the two major issues accentuated by the depression.

"The motor vehicle retail trade dealers eagerly advocated a code which would regulate competition with reference to the used car and its use in lieu of money. The other trade practice provisions contained in the code largely tended to strengthen and prevent evasion of the used car allowance provision, and in addition covered 'bootlegging' of new cars and false speedometer adjustments.

"During the code period, on the basis of certain spot checks taken, dealers showed a reduction in their used car losses which was attributed to the used car allowance provision contained in the code. It is contended, however, that this improvement in the used car situation was virtually offset by the action of the manufacturers in eliminating certain accessory and delivery profits which they had previously enjoyed. This, they claimed, amounted to a net reduction in the gross profit margin. The dealers also contended that the manufacturers in their struggle to maintain volume, especially during the depression, expanded their policy of establishing competitive dealers in the same territory, which tended to reduce each individual dealer's sales potential to such an extent that it was no longer possible for him to make a fair profit. This is commonly known as the 'multiplicity of dealerships' and was not covered by any provisions, either in the manufacturers' code or the dealers' code.

"Generally speaking, it is felt that the maximum used car allowance provision of the motor vehicle retail dealers' code provided a more accurate measure of the market value of the used automobile than was obtained before the code period. It can be argued, however, that fixing a maximum allowance price even though it is above the average price, works a hardship on those consumers and on certain dealers from whom they buy, where the dealers' operating efficiency is considerably above the average, or whose physical and geographical set-up enables them to operate at greatly reduced overhead cost of sales as contrasted with certain other competing dealers. Indeed, within the same geographical sales area, there has been shown to be a wide divergence in the market for used cars. A case in point is Washington and Philadelphia, both in the same area of regulation for maximum values, which had during 1934 a market differential of some 25 per cent in the value of used car merchandise."

NRA Study to Eliminate Friction

(Continued from page 209)

sired to establish certain trade practices in order to govern competition among themselves.

"One effect of the code in the automobile manufacturing industry was to make the industry conscious of the necessity of improving its labor relations and working conditions. It can be said that, even though the labor provisions in this code were very flexible, they did tend to increase the irregularity of employment during the year. The question can be raised, however: Is not this irregularity of employment and the spreading of work desirable as contrasted with a group receiving no employment at all throughout the year? Before a definite answer can be given, close study and consideration of the other fields of employment, such as agrarian, should be made, and its tendency to balance out the irregularity of industrial employment in certain areas.

"For the past 10 years automobile production during the annual period has assumed approximately the same

curve, reaching its maximum in the late spring months of April and May, and its minimum some time late in October or the first part of November. By Executive order of the President, based on studies that were conducted with reference to a possible leveling of production, it was recommended that the new model urge be superimposed on the normal 'low' area in the early winter months by the introduction of new models in the late fall of the year. It was felt that this would help to regularize employment and prevent superimposing a new model urge on top of a normal season urge, as has been the case the past 10 years when the shows were announced in January. At the present writing, the partial success of the fall show has been shown by the stimulation of the demand for automobiles in a normal slack season. But a carryover from the fall show period of a large used car inventory resulting from this new model impetus may strain the financial reserves of the dealer during the cold winter months